History

of the

Automobile

STORY OF THE AUTOMOBILE

from the

First Toy Car to the Present Perfect Self Propelled Vehicle

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PREFACE.

"Do you know when the first automobile was run?" The question started me to investigate and the result in the following pages is a little story of the automobile.

When retrospective views of past centuries are indulged, it usually leads the thinking mortal by the process of antithesis, to make predictions for the greater development of the things that are known, or to foretell of "coming events that cast their shadows before." By intuition, which has been aptly called God's tuition, some sensitive mentalities obtain a glimpse behind the curtain of futurity. A general account of it is handed down through generations of mankind, and time has shown that the predictions, or a part of them, at least, have been fulfilled. Crook's tube was predicted by Prof. Crook's wife, long before he hit upon the wonderful discovery.

Roger Bacon, in the fourteenth century, said: "We will be able to construct machines which will propel ships with greater speed than a whole garrison of rowers, and which will need only one pilot to guide them; we will be able to propel carriages with an incredible speed without the assist-

ance of any animal, and we will be able to make machines which, by means of wings, will enable us to fly in the air like birds." Bacon did not live to see the steam car or the ocean grayhound. Jules Verne little thought when he wrote "Eighty Days Around the World" that he would live to see, as he said, his most wild imagination realized.

From the sledges of poles fastened with deer-skin strings upon which the American squaw transported her belongings from place to place to the beautiful American Queen among women tooling her perfectly appointed automobile about the haunts of fashion; from the hard saddle of the robber-barons and proud stern-willed emperors who rode in jolting chariots without springs or rubber tires to the modern automobilists speeding their machines in luxurious ease, taking chances that would have driven the past generation to early graves, is an evolution staggering to the conception of the ordinary mind. With the advent of the crowning glory of the mechanical world have also come the men and women with nerves sufficiently schooled to use and be amused by them.

Every conceivable form of mechanical contrivance that could be demonstrated by working models have been experimented with during the past two centuries, and the result which to the present age appears wonderful will doubtless be looked upon by future generations as extremely crude inventions. To place this before the mind

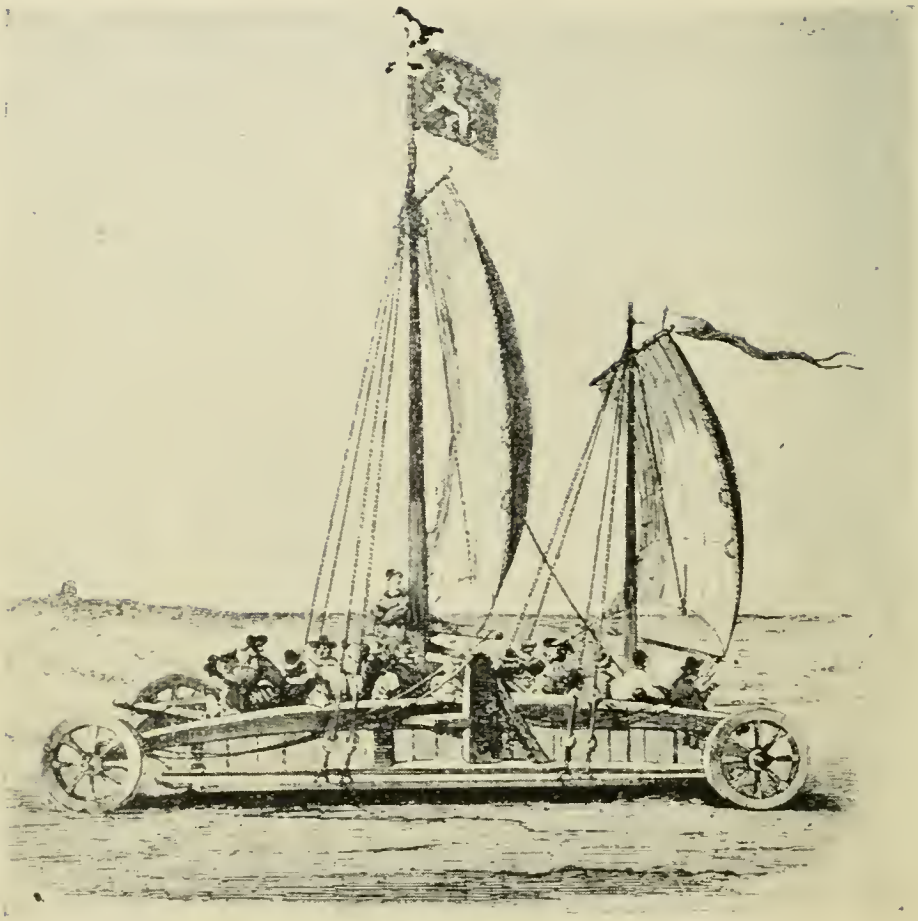
of the readers I present the following pages.

The adaptability of the mechanically-propelled vehicles has no limit. In the cities they are used for 'busses, cabs, ambulances, patrol wagons, ice wagons, heavy trucks, fire engines, garbage collectors, light delivery wagons, doctors' gigs and pleasure outing on the fashionable drives. The motor is edging its way into the agricultural plow, the lawn mower, and the harvesting machine. The large lorries for army and navy purposes are startling the natives in the out-of-way places on the globe. The automobile wheels have rolled on the frozen grounds of Alaska and the torrid sands of the desert of Africa; from the lowlands of Long Island to the highest trails in the Rockies. The inventor and the mechanic in their combined ability have made this possible and the inventor driven by a force he knows little of, is constantly seeking new devices from an unknown world where the machinery of operation when compared to man's work is as a Geneva watch to a child's crude toy.

HISTORY OF AUTOMOBILING.

Early Devices.

Nearly three centuries ago, Duc de la Rochefoucauld said: "We have more power than will; and it is often by way of excuse to ourselves that we fancy things are impossible." He might have said: We think things are impossible, but we fancy everything possible. We have more power than a comprehensive intelligence of it. Hence that intuitive desire for transportation with the rapidity of thought. With all the devices and inventions for quick transportation the desire of the human mind for speed has not been satisfied—faster—still faster is the cry from the battlements of civilization. No demur is made at any rate of speed obtained. Only the question of safety is asked. When chauffeurs tell us that while riding at the fastest speed the desire for a still faster rate is ever present, the rapid transit problem limit must find its solution in the limitless realms of the air. We must go ahead. Ever to do what you are afraid of. When Ajax was advised to offer prayers to the Gods for his success in battle, he objected, and said he would win without their help. Which he did. The "New Thought" cult might accept the bold Greek as its founder.



Steven's Sailing Chariot, Circa, 1600.

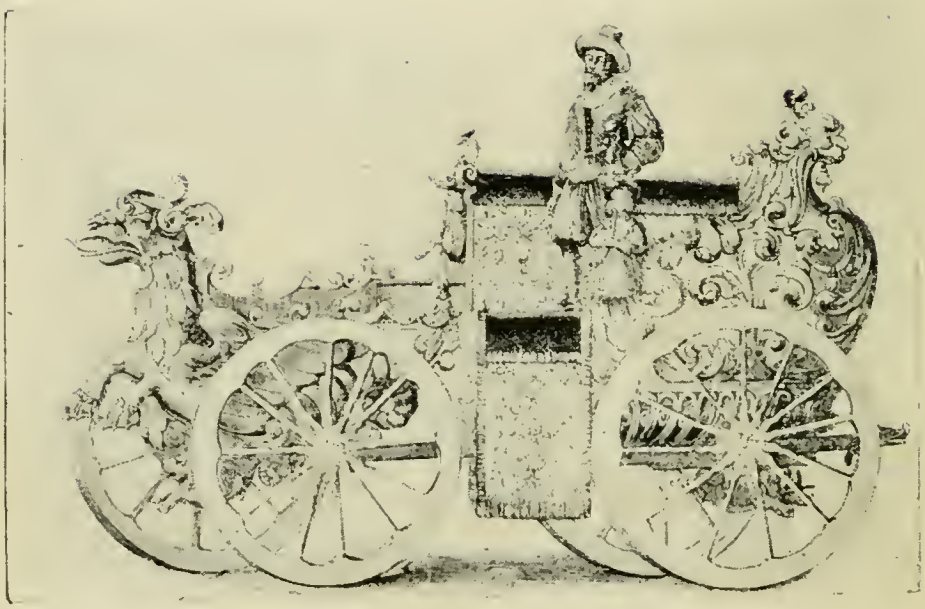
Rapid transportation has been the dream of nations and dreams come true. Macaulay says: "Those projects which abridge distance have done most for the civilization and happiness of our species." Constructive genius finds its greatest outlet in the fields of mechanically propelled vehicles. After a century of great achievements in the development of transportation, we have practically reverted to the early days of automobiling on the highways, where the first automobiles were experimented.

In the early part of the nineteenth century as well as at the present time, the rough condition of the road surfaces offered difficult problems to mechanical engineers.

The exorbitant toll rates and the public prejudice aroused by the "horse interest" faction in the last century discouraged and held back the industry.

It seems strange that only two hundred and forty years ago, the field of physical phenomena was only surveyed through the knot holes in the fence of ignorance that encircled it. Pepys wrote in his diary in 1663, that King Charles II. "Mightily laughed at Gresham College (the Royal Society) for spending time only in weighing of ayre, and doing nothing else since they sat."

Mechanical inventiveness once freed from the trammels of war, the restraint of theologians and the ridicule of divinely appointed rulers, made rapid progress.



Nuremberg, German Car, 1649.

From the description left by Hero, 300 B. C., of a primitive engine, which he terms aeolipile, has been developed the motor engine. Simple in construction, requiring but little space, yet it gives the power of many horses for the world's work.

Automobiles are not of recent use. For three hundred years mechanical engineers have given the horseless vehicle much attention and study. Men with an inventive turn of mind in different European countries have experimented with devices for propelling vehicles. Wheels as rolling devices by ox and horse power were known four thousand years ago; with mechanical power about three hundred years ago.

First Automobile.

The first automobile was built and run in 1680, by Sir Isaac Newton. The car was a simple affair with an aeolipile suspended on a frame on four wheels. The inventor sat in front holding a long pole that controlled the steam emission. As long as the water generated steam, Newton could ride, but at best it was only a toy.

Automobile in China.

Father Verbiest, a missionary at Pekin, China, wrote in 1680 that an aeolipile was constructed in a horseless wagon there, and the steam from the boiler was made to blow on a wheel with four wings attached. Motion was given to the wheels

First Automobile, "Newton," 1680.

of the car by gears, and the vehicle moved with much velocity as long as the steam lasted. The car was guided by a helm.

From the appearance of the Newton automobile until a century later the progress of automobiling was slow. Scientific men of the time, though, never doubted the ultimate success of motor vehicles.

The development of the steam engine for work in mines, tunnels and other large enterprises made rapid progress. Engineers were giving their attention to stationary engines. Suggestions for experiments with horseless vehicles were presented to Watt in 1759, but he was too busy to give them attention. Mr. Boulton, his partner, made a few experiments.

Nuremberg Car.

The citizens of Nuremberg, in Germany, were startled out of their lethargy in 1649 by Johann Hantsch, an inventor, who built and ran an auto car in that city. It was elaborately constructed. On the front were two fierce looking dragon images, with mechanically moving eyes, and steam was snorted forth from their nostrils. If that was not enough to frighten the pedestrian and clear the way for the auto car, two angels attached to the upper part of the car were constructed to blow trumpets of warning. The car was considered passing strange; 'twas wonderful. It was purchased by the Crown Prince of Sweden, and at-

Cugnot's French War Car, 1769.

tracted so much attention that a duplicate was ordered by the King of Denmark. The principles of mechanism, it is stated, were supposed to be a system of cog wheels worked by two men concealed in the car.

Elie Richards, a physician of La Rochelle, owned and ran an auto car about the time the Nuremberg car was popular. It had a canopy, and the steering was by reins attached to the front wheel. A servant was placed in a box in the rear. His duties were to rotate the rear wheels by a tread which set a cog wheel device in motion.

French War Automobile.

In France much attention was given to the development of automobiling.

The first war automobile was built by Michael Joseph Cugnot, a French army officer, in 1769. It was constructed at Paris for transporting French artillery. The car had one speed forward and reverse.

The Cugnot machine was the first application of the high-pressure engine, with cylinders and pistons, which produced rotary motion. The car was the first in the world to be propelled by steam. It had three wheels. The front wheel was driven by two cylinders acting upon a crank shaft and geared by ratchets to the wheel shaft. The boiler and engine overhung the front steering wheel. Its speed was 2¼ miles an hour. The car would skid into ditches and against fences which made

Murdock's "Three Wheeler," 1784.

the invention a questionable blessing, but the intrepid Frenchman was not discouraged. In fact, all of the early inventors never waivered in their belief of the practical solution of a horseless vehicle.

A second car was built by Cugnot in 1770, with a 13-inch steam cylinder.

It had a single acting cylinder with pistons connected to oscillating arms with pawls acting on ratchet wheels fixed to the driving wheel axle. Each stroke of a piston made a quarter revolution of the driving wheel. It was front heavy, and took a header while turning a corner. The uncertain habits of this second war monster dampened the enthusiasm of the promoters and affairs settled down to the old condition of things. The mortal remains of War Car II. are preserved in the Conservatoire des Arts et Metiers, in Paris.

The latest war automobile is in service in the French army. The armor about the body of the carriage is high enough to protect the gunner. The gun in the car may be swung in all directions, like the turret gun in a battleship.

Watt's Patent.

This "Will-o'-the-Wisp" idea of a horseless vehicle was in the early days one of the most fascinating fancies for men of inventive minds.

Watt had perfected in 1782, a double-acting engine which produced a continuous rotatory motion, and in the application for patents he specified:

Smyington Touring Car, 1786.

"My seventh new improvement is upon steam engines which are applied to give motion to wheel carriages for removing persons, or goods, or other matters, from place to place, in which the engines themselves must be portable. I apply to this use engines with two cylinders which act alternately. I communicate the power of these engines to the axletree of one or more of the wheels of the carriage, or to another axis connected with the axletree of the carriage by means of toothed wheels." Dr. Erasmus Darwin, it is claimed, urged Matthew Boulton, Watt's partner, to construct a "fiery chariot" in 1765. It only resulted in a set of plans being sketched and a paper on the subject was published by a Mr. Edgeworth, who received a gold medal for his scheme, from the Society of Arts.

Prominent men who were observing the tendency of the times predicted a great future in the mechanical line, and many engineers were at work on the self propelled carriage.

In 1781 William Murdock built in England a "fiery little monster" that frightened the vicar, which was a very wrong thing to do, for the vicar held the market on "fright" as every parishoner, could vouch. Bishop Berkeley, a progressive Englishman in 1730, said: "Mark me, ere long we shall see a pan of coals brought to use in place of a feed of oats."

The rapid transit bee had blown in the bonnet

Read's Steam Truck, 1790.

of the stage line promoters to London in 1754. The coach drawn by horses ran 50 miles a day.

In the reports of the times about the "Flying Coach" is found the following remark of the English Lord Chancellor: "Such swift travelling was considered dangerous as well as wonderful and I was gravely advised to stay a day in York on my journey between Edinburgh and London, as several passengers who had gone through without stopping had died of apoplexy from the rapidity of motion." Kindly let us recall that the "rapidity of motion" was about 50 miles a day. To-day the steam carriage runs from this city to Chicago, about 1,000 miles, in twenty hours, and the passengers yawn, stretch their arms and wish the train would "hurry up."

The men of the Lord Chancellor's day, if they could return, would no more ride in a "Twentieth Century" train than most of the men on the earth now would glide in an airship. Dumont and his air line experiments are attracting the public attention of the present time. Most people if they were invited by Dumont for a ride in his car would unhesitatingly decline. The early automobile was held at that time in the same regard by the public as the airship is at present.

"Roads are many; authentic finger-points are few," says Carlyle.

Trevithick's Steam Car. 1801.

Ode to Steam.

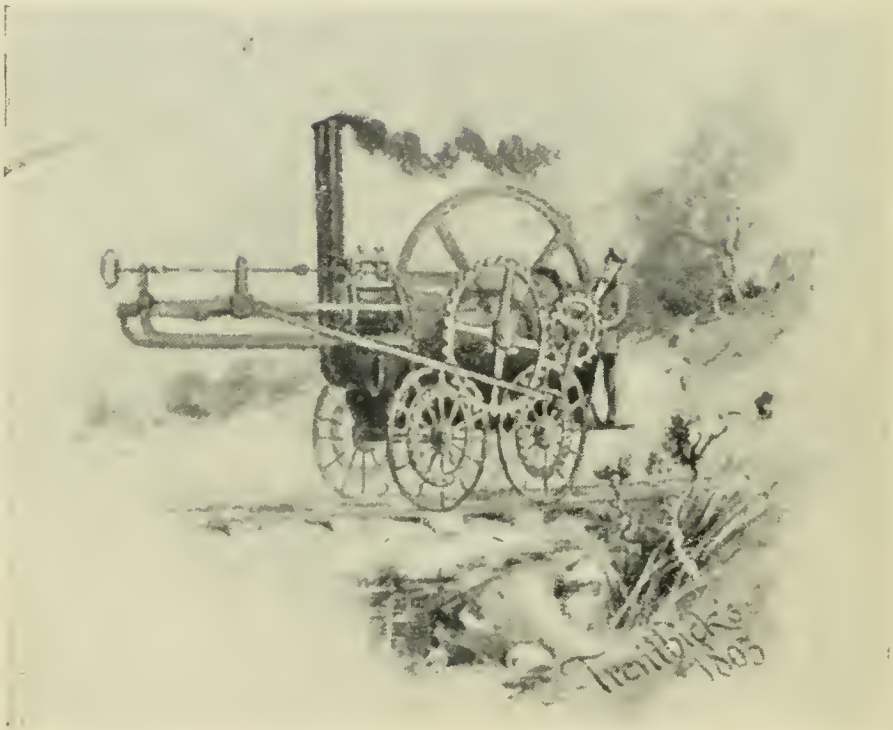
Erasmus Darwin was quite enthusiastic about the automobile in 1765; he urged Watts to build a "fiery chariot." Darwin heralded steam in his "Botanic Garden" as follows:

"Soon shall thy arm, unconquered steam, afar
Drag the slow barge, or drive the rapid car;
On, on, wide waving wings, expanded bear
Thy flying chariot through the field of air.
Fair crews triumphant, leaning from above,
Shall wave their fluttering kerchiefs as they move,
Or warrior bands alarm the gaping crowds,
And armies shrink beneath the shadowy clouds."

A Puffing Devil.

When the modern touring machine is speeding along the highway and it is called a "Red Devil" which is a common term for the car, more truth than poetry is in the term especially if a reckless chauffeur is at the wheel. Tracing the origin of this appellation of the Evil one to vehicles, it was found that over one hundred years ago the name was given to an English inventor's car

Richard Trevithick, of Camborne, Cornwall, England, was among the first inventors to use a high-pressure non-condensing engine in an automobile. On December 25, 1801, he assembled the parts of an automobile in a blacksmith's shop at Camborne, and like Darius Green, he started to fly off like a bird. Richard went farther than Darius, for he speeded half a mile before "something hap-



Trevithick's Steam Car, 1803.

pened," while he was riding up grade on a highway known as Beacon Hill. The next day after the car was repaired, it made a mile run, and an ancient dame, observing the car, said: "Good gracious! What will be done next? I can't compare it to anything but a walking, puffing devil."

The third day, Mr. Trevithick, Captain Andrew Vivian and party started on a tour. They were making a curve at a good speed when the Captain lost his grip on the lever and the car skidded and overturned. Mr. Davies Gilbert, in relating the incident, said the carriage was forced under some shelter, and the party repaired for food and clothing. When they returned to the vehicle, everything combustible in the machine and storehouse had disappeared. The venturesome automobilists built another car in London, 1803; crowds went to see the machine, and it was popularly known as Captain Trevithick's "Puffing Devil." He termed the car a tram-engine, or traveling engine. It was the first movement by steam on rails.

The conservative element were at work industriously opposing "any nonsensical ideas of travel ing for the sport of it." The citizens of the small towns were advised to oppose this "idea of gadding to town. Gentlemen come to London oftener than they need, and the ladies quickly follow the men. My lady must have the Mode, the latest fashion. She must buy her clothes in London. While there, she needs must go to plays, balls, and treats

Trevithick's Steam Car, 1805.

When they get such habits of jollity, and love gaiety and pleasure, nothing afterwards will serve them if ever they should fix their minds to live there again."

Country Highways.

The condition of the highways of to-day is considered abominable by the touring automobilists, and agitation for better roads has been started in all sections of the country. But they are in very good condition when compared to the highway of "ye olden times." Automobiling would have been impossible in the country in 1770, either in America or in England. The reports returned by the English Parliamentary Committee in 1770, of the highways, stated that the mud on the main roads was four feet in depth, and that the by-roads were impassable, and so narrow that a mouse could not pass a carriage if they met. It was a condition that made travelling an onerous duty, and pleasure touring was out of the question.

The Duke of Somerset, who kept up two establishments, one in London and one in Sussex, was wont to send out in advance, notices, when he intended driving from the city to his country estate. Rustics were instructed to meet his grace on the highway with poles and lanterns to help his carriages out of the mud holes and sloughs. Conditions as described would not be conducive to the development of automobiles. Fifty years later showed a vast improvement in the highways, and

Trevithick's "Catch Me, Who Can Catch," 1808.

the mail coaches were making regularly scheduled trips. Vehicles propelled with sails were introduced and a carriage drawn by a kite was built and run by Viney & Pocock. The driver held the kite string, and considerable speed was made by this scheme of motor power, but the aerial system was found to be impractical and was finally abandoned.

Trevithick's Steam Car.

Trevithick's plan for a locomotive was adopted at Coalbrookdale, in 1802, and a machine was made which was sent to London. It was attached to a coach and ran along the city streets. The engine gave a very good account of itself, but on one occasion, while going along the street, it ran into a garden wall, and that started a row. The mishap provoked the cab drivers who were waiting an opportunity for an onslaught, and when this accident occurred, the outfit with its passengers received a warm reception of cabbage stumps, decayed onions and eggs. Trevithick took his next steam car to the railway tracks.

American Automobiles.

In the United States, Oliver Evans obtained privileges in Pennsylvania and Maryland to operate motor cars in 1787.

Nathan Reed, of Warren, Mass., was granted a patent for a steam carriage in 1790. It was the first experiment with an automobile in America.

The greatest sensation in the early days was

Evans' Combination Machine, 1804.

made in Philadelphia, where a complex device was used to combine land and water transportation in one vehicle.

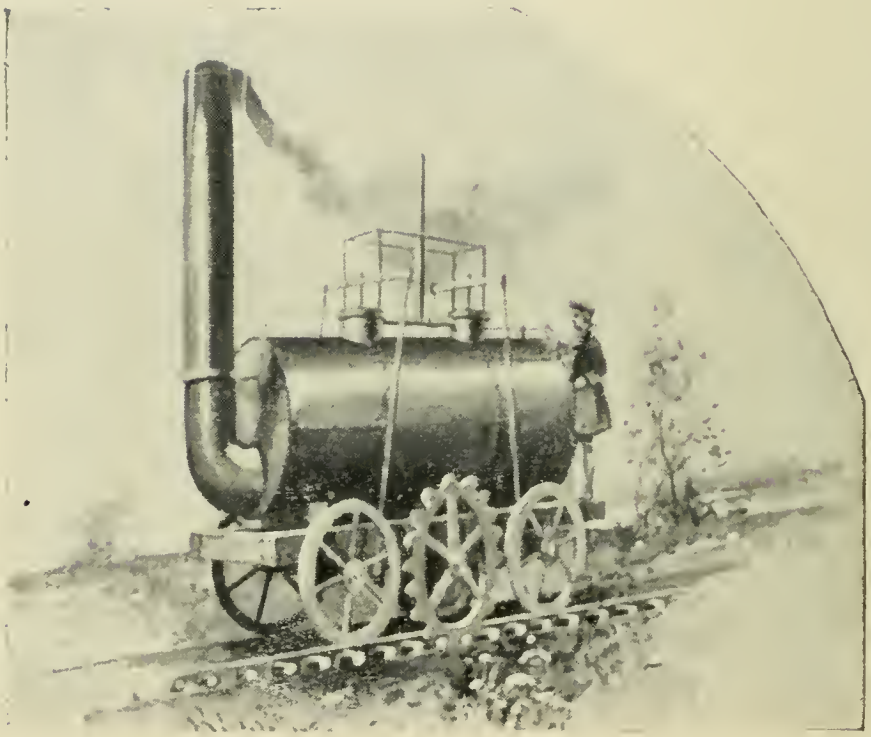
Quaker City Auto in 1804.

Oliver Evans, a noted American inventor, in 1804, applied one of his engines in the transportation of a large flat-bottomed craft, built on an order of the Board of Health of Philadelphia. It was mounted on wheels, and he ran it under steam over the cobble stones on Market street, and into the Schuylkill River. The craft had a paddle wheel astern. The engine was then applied to the wheel. The combination automobile, truck and steamboat was named Oruktor Amphibolis. Its weight was about twenty tons.

Early Traction.

During the early part of the eighteenth century, demonstration had proven that the steam car was an important means of transportation, and the principal drawback was the condition of the highways. As early as 1770 primitive tracks were laid for steam cars. They were simply planks of timber, and the construction was found serviceable, but the exposure to the weather decayed the material, and the expense of keeping the road in condition was a detriment to the enterprise.

Experiments were made with different kinds of material, but the result was not encouraging. Later, sleepers of timber were built, and angle bars of cast iron were laid across the longitudinal



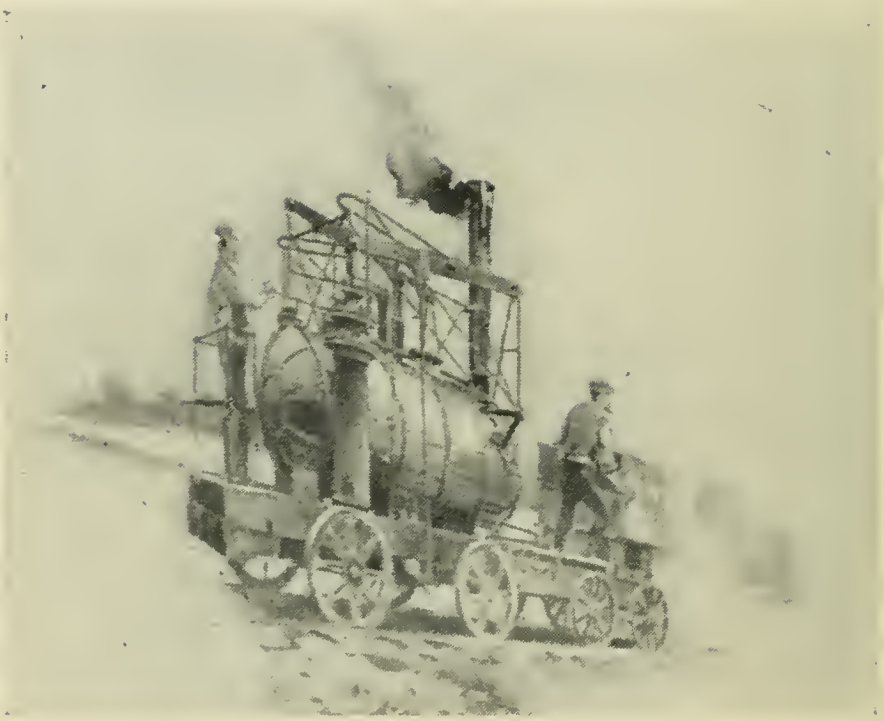
Blenkinsop's Rack Locomotive, 1812.

sleepers. This was a decided advance from the system employed in 1738, which was a construction of road with cast iron plates. In 1776, the plates were discarded and the angle bars were introduced. William Jessop, an inventor, took up the study of the railroad system, and in 1789, invented what is known as the flanger rails.

Steam cars running on rails were the bent of the mechanical mind in England and America. From the first experiment of carriages on rails in 1803 by Trevithick's car, 100 years ago this year, great achievements have been gained. The first demonstration of adhesion of smooth wheels to smooth rails was made with a steam car named "Puffing Billy." The original car is in the South Kensington Museum, London. From the experiment in 1803 to 1840, 65 steam cars were built and tested. A great many mechanical problems were solved in those days which is a rich legacy handed down to the manufacturer of the present time. Among the early experiments were George Stephenson's famous "Rocket," built and run in 1829; Ericson's "Novelty" in the same year, and the "De Witt Clinton," the first locomotive run in the State of New York on the Mohawk and Hudson Railroad in 1831. Automobiles on the highways were being neglected.

First American Railroad.

Peter Cooper built the first American locomotive



William Hedley's "Puffing Billy," 1813.

in 1829. The car ran on the B. & O. R. R. route, 18 miles from Baltimore to Ellicott Mills.

Brunton built a steam car in 1813 which was called the Horse Leg. The piston propelled the car by means of legs with knee joints pressing upon the rails.

In the year of 1829, W. H. James built a steam coach with five seats which was successfully run 15 miles an hour. Among others who spent considerable time and money in experimenting was the firm of Burnstall & Hill. The model was a radical change from the carriages built at the time. The Burnstall--Hill car was constructed to drive all the wheels by a fore and aft shaft with bevel gears. The car ran at a speed of four miles an hour, but it was not a success.

Gurney's Steam Car, 1827.

A steam car built by Gurney, an English inventor, in 1827, was very successful, and was run about the streets of London with much satisfaction to the inventor. The public at the time was not over confident of the machinery. It was considered "taking your life in your hands" to ride in the "new-fangled things." The Mirror, in its issue of December 15, 1827, decided to assure the public that "the boiler is perfectly safe, and even if it did burst, there was not the slightest chance of a passenger being injured, because it was construc-

Brunton's Horse Leg, 1813.

ted upon philosophical principles and upon a plan totally different from anything previously in use."

About this time Tom Hood wrote in his Conveyancing:

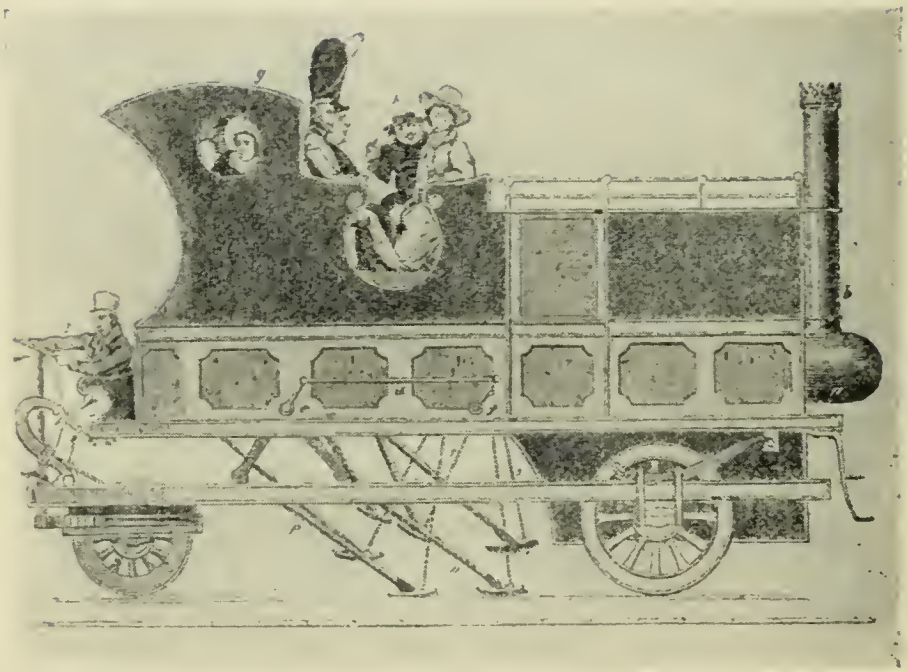
"Instead of journeys, people now
May go upon a Gurney,
With steam to do the horses' work."

Gurney built a second car in 1831, and a barouche was attached to it. The vehicles were run at a speed of twelve miles an hour. Runs were made from London to Brighton, but the new car was not destined to have a vegetable existence.

London Automobile.

The Gurney carriage of 1827 ran about London for two years. The car ran 85 miles on a continuous trip in 10 hours. From the description given it had a two-cylinder vertical engine with complete and regular circulation of water. Cranks on the rear wheels were turned by the engine, and the excentrics on the axle drove the valve gearings and the valve.

The popular opinion of the public was averse to automobiles in the early part of the nineteenth century. Many people were afraid of the vehicles. Accidents were common to pedestrians and vehicles. In 1831 a passenger car in London was run nine miles in 55 minutes, and it created much antipathy. The car met with many mishaps



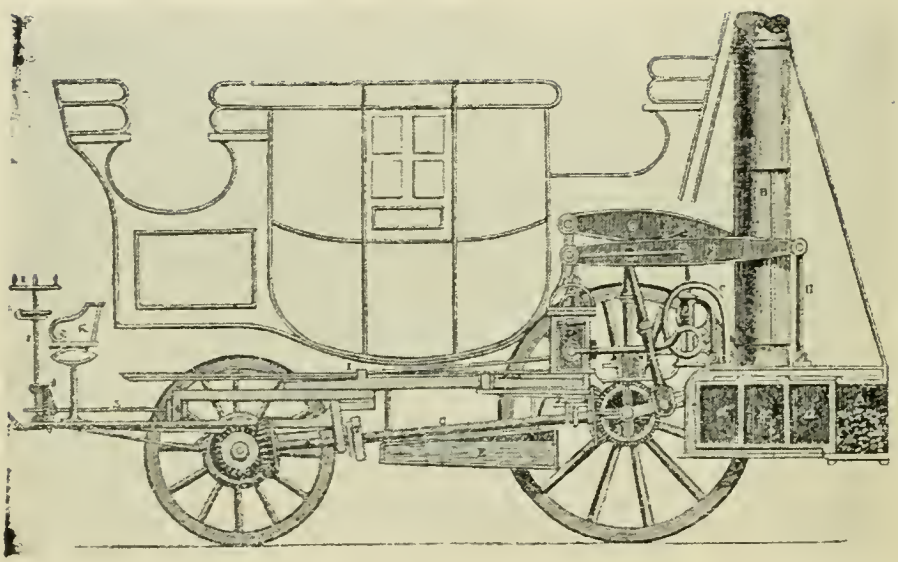
Gordon's Coach, 1824.

through the malicious actions of its enemies, who placed stones in its way. Many a rock was thrown at the luckless heads of the riders. Affairs reached such a critical condition that automobilists and their antagonists appealed to the law.

Gurney's secretary wrote an interesting account of a trip from Brighton on this car, when the Duke of Wellington and other notables were passengers: "As the party was coming along the highway, there appeared to be a fair, and an immense crowd of people had collected. The mass was so dense that it was impossible to move the carriage through them, but at a very slow pace. The people were principally composed of agricultural labourers and the manufacturers of the district. They considered the carriage injurious to their interests; they said it was a carriage drawn by machinery.

"A cry of 'down with machinery' was raised in different places, and an attack of a very serious nature commenced upon the carriage and our whole party; some were seriously injured. Some of the small connecting rods were injured; the more important working parts of the carriage were either too hot to be handled or too strong to be damaged by the means then in the power of the mob.

"Here was an end to our proceeding further that

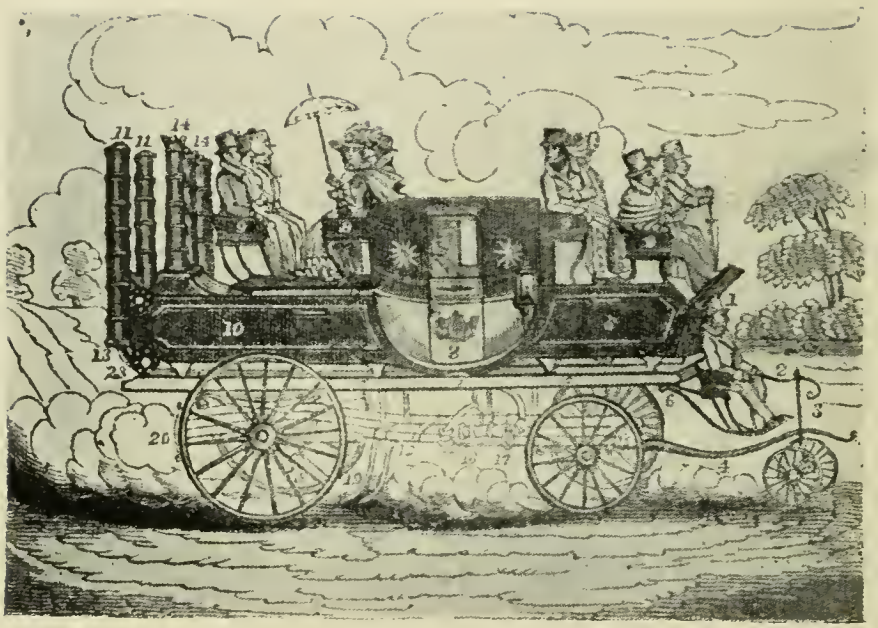


Burstall & Hill's Car, 1824.

day. Mr. Gurney was much disabled, and Mr. Bailey, our principal engineer, had to be taken on to Bath in a post carriage in an insensible state, from the injuries he had received."

David Gordon built a walking carriage in 1824 and devoted several years to perfecting it. The feet under the machine were operated with a three-throw crank shaft. Hancock built an elaborate steam omnibus that carried passengers about London in 1839. It ran 12 miles an hour and made 20 miles an hour on a straightaway. He went into the industry on a large scale. His first venture was a car named the "Infant," built in 1828; another was built in 1830. The "Autopsy" was built and run in 1833. The same year a steam drag with a seating capacity for eight passengers was built to be shipped to Vienna. It was afterwards remodeled to hold 18 passengers and was run for twenty weeks from London to Statford. The car covered 4,200 miles and carried a total of 12,761 passengers in that time. A car with four-wheel steer, the wheels being on a radial stud axle, and friction clutch bands was built by Gibbs in 1830.

Summers and Ogle built two three-wheel steam cars in 1831. The driving wheel was 5 feet 6 inches. The cars were constructed with a 20-horse power boiler. The cylinder had a diameter of 7½ inches and the stroke was 18 inches. The steam



Gurney's Model, 1827.

pressure was 200 pounds per square inch; 56 pounds per horse power. The car weighed three tons and was run at a speed of 30 miles an hour.

Dance Steam Coach.

A steam coach route was introduced by Dance, in 1831, and he started a strong competition with the old horse stage, by reducing rates. The Turnpike trust proved too powerful for the steam coach, with the cut-rate fare inducement. The trust succeeded in securing a new act of Parliament, granting the turnpike company the power of increasing the tolls on all steam vehicles.

When Dance was operating his 'bus line in 1831 the toll on steam carriages was advanced to one pound ($5), while the coach drawn by horses was allowed to pass along at one shilling (25 cents). The energetic opposition to steam carriages did not stop at that. Obstructions of stone piles 18 inches in height were erected on the highway. Some sections of the road were impassable for any traffic and the horse coach was compelled to go over adjacent roads.

Manufacturers of steam vehicles did not intend to build cars for hurdle races or to run after the hounds, still the machines gave a good account of themselves under the handicap. A law was enacted to compel all horseless vehicles running on the highway to have a man on foot preceding them.

The Rocket, 1829, Built by George Stephenson.

This law was alive and well in 1896 when Mrs. Koosen, an English woman automobilist was speeding with a modern automobile at Berwick-on-Tweed. This bold law-breaker was arrested and fined six pence with costs of 19 shillings, six pence for "using a horseless carriage without having a man on foot preceding it."

The theme might be considered amusing if it was not for the fact that a wise solon in Pennsylvania recently proposed to have drivers of automobiles who speed as fast as a good horse can trot on the highway, arrested, confined in jail and their machines confiscated and disposed of as the worthy squire saw fit. Truly the modern Dogberry helps Justice to hold the scales. But, anon, to the automobile of the last century.

Among the early motorists, Dance was an enthusiast who paid royally for his experience.

Dance was running the steam coach from February to June, 1831. His carriage was the latest Gurney model. It ran 396 journeys, a total mileage of 3,644. When the new act of Parliament raising the tolls on steam carriages came into effect, he could foresee the business would be a failure. He followed a precept of the Polish King Stanislaus, although he may not have known his highness, who said: "Speak your mind when its necessary that you should do so, and have the courage to face a

Ericson's Novelty, 1829.

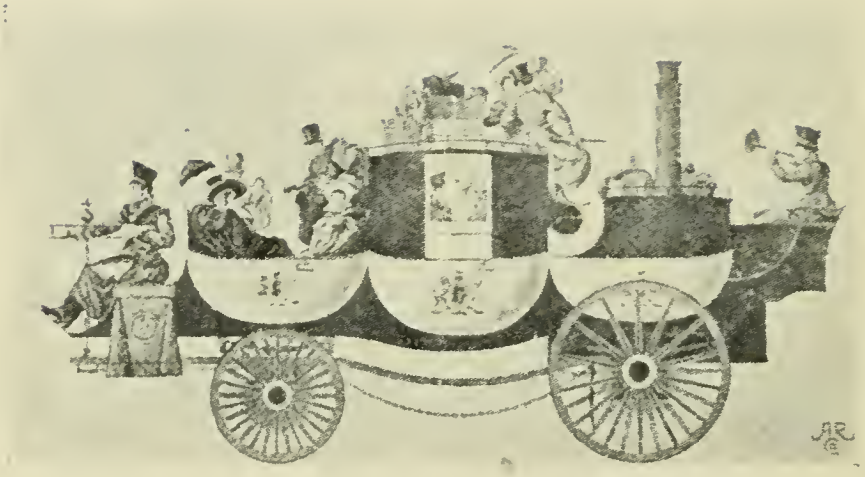
difficulty, lest it kick you harder than you bargain for." Dance expressed his opinion and discontinued the 'bus line.

First Automobile Ordinance.

Parliament in 1831 appointed a committee to investigate the complaints made against the automobile. The committee after thoroughly investigating the matter made its report that the vehicles were safe, and could not be considered a nuisance. They were cheaper than horses, but a regulation should govern the speed of the cars running on the highway. A law was made and notice given to all users and owners of steam vehicles that "the maximum speed on the streets and highways shall be ten miles an hour, and that vehicles shall weigh under three tons, with a maximum passenger capacity of 14 persons."

The result was not a victory for either side. While the horse 'bus managers were defeated in their movement to prevent automobiling on the highways, the motor men were not allowed to run the cars faster than one mile in six minutes.

Records of speed at that time were made by the steam automobile, which were received by the public with scant creditability. A writer in the Quarterly Review, in 1789, said: "What can be more



James & Anderson's Coach, 1829.

palpably absurd and ridiculous than the prospect held out of a locomotive traveling twice as fast as a stage coach?"

Racing Cars in 1833.

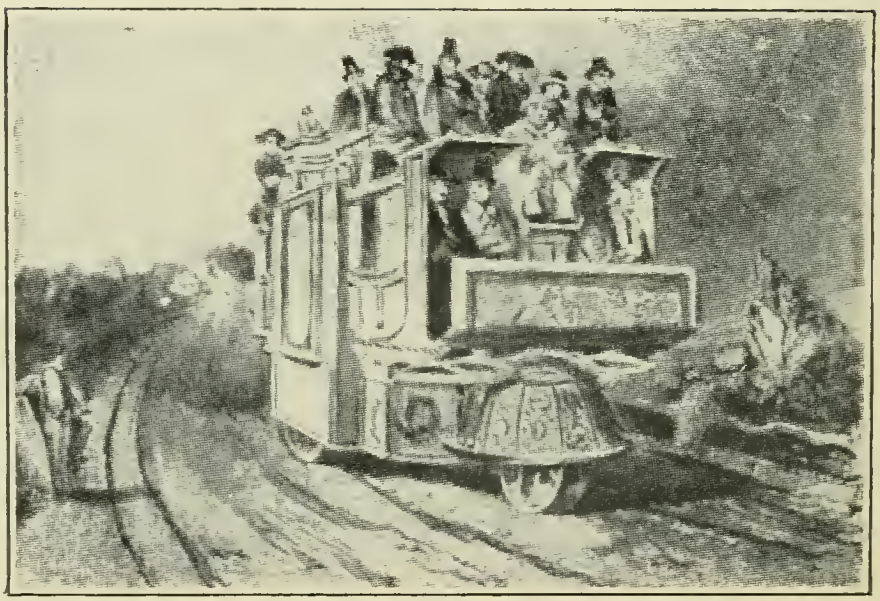
Hancock built a racing automobile in 1833, which was named the Autopsy. The car was run in and out through the crowded streets of London with perfect control. The carriage had a seating capacity for ten passengers and a coach or trailer was attached capable of holding six persons. A speed of 14 miles an hour was made on the straightaway run and 8 miles on grade

Erin Automobile.

The Erin automobile was built in 1835 and was run at a speed of 10 miles an hour. The car carried 20 passengers and had three trailers which accommodated 50 persons.

Five years later the Phaeton car was built and ran at a speed of 20 miles an hour. The speed of the Phaeton was the cause of bitter feeling among those who were interested in the stage routes and dealers in horses. Hostile legislation and bad roads combined to make an opposition too strong for the development of the automobile industry and the use of the highways was gradually abandoned.

Hancock wrote in a letter about 1831: "Some months ago I offered to convey the mails at 20



Church's Three Wheel Coach, 1833.

miles an hour and if my experience had not borne me out I should certainly never have made the offer. * * * Of course I am in no small degree mortified after having spent fourteen years of the prime of my life to perfect this invention, to meet with less of public encouragement than clamor and prejudice, when I know well that society would be benefited by the general adoption of steam locomotion on common roads; but I have yet hope that at no far distant time it will be a favorite mode of transit."

Hancock retired from the carriage business and became associated with his brother in the rubber trade.

In 1834 Hancock built the Era, afterwards called the Erin car. Hancock built a phaeton for his private use. He drove it about London at a speed of 12 miles an hour. On a test of a straightaway the phaeton ran 20 miles an hour.

Hancock's carriages, 'bus and tractors were employed during the years from 1831 to 1840. He constructed cars with vertical tubular boilers, chain, sprocket gears and inverted engines. Modern economics owe much to Hancock. He managed an automobile 'bus line from London to Islington, Paddington and Stafford.

Colonel Macaroni, an Italian, formed a partnership with Squires. The firm built cars after Maca-

DeWitt Clinton, 1831, First Steam Car Run in N. Y State.

roni's models. They owned patents on vertical tubular boilers. The boilers were worked under 150 pounds of steam pressure. A car was built and run from Paddington to Edgeware. It ran at a speed of 16 miles an hour. The car ran over 1,700 miles with no repairs. Models were built and shipped to Paris and Belgium.

A steam coach was run from St. George Square, Glasgow, to Paisley in 1846. It held six passengers inside and twenty outside. A stage coach was built that could carry 40 people and it drew a trailer which held six passengers besides the fuel and water. Other steam carriage builders were Carrett, Yarrow, Haybell, Tangye, and Todd.

A serious accident was recorded in 1834. The steam stage running from Glasgow to Paisley had a boiler explosion and three persons were killed.

During the high-tide of the automobiling prosperity from 1830 to 1840, companies and schemes were floated by promoters and speculators who offered all the rainbow promises of the get-rich-in-a-hurry method.

English Vehicles.

The high tide of popularity of automobiling in England during 1830-1835 gradually receded; the energy of the people at that time was spent in exploiting capital, promoting companies and applying for patents of machines, many of which only exist-

Dance's 'Bus. 1833.

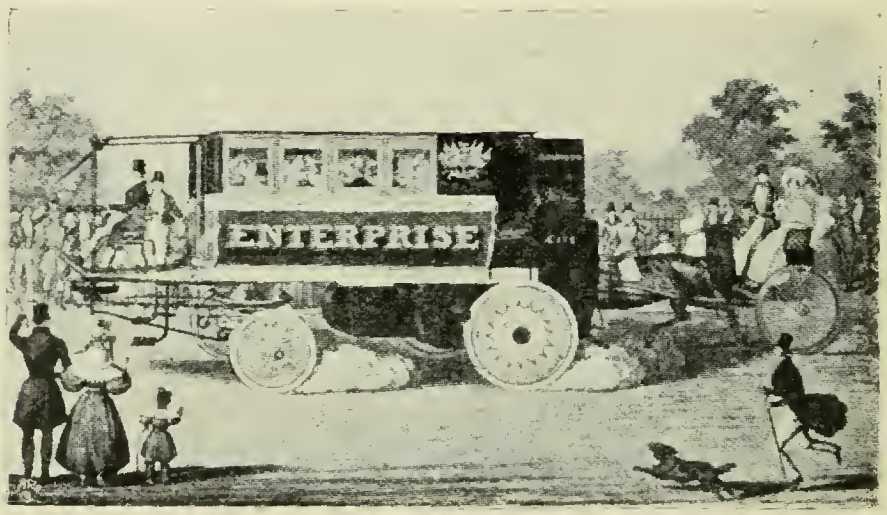
ed on paper. A few inventors gave their serious attention to the development of the steam carriage during the following decade. Ricketts, of Buckingham, constructed a few cars in 1860. Crude in appearance, they were more of a traction engine design. Three passengers could be seated in front; the car was driven 10 miles an hour. The Earl of

The industry of those days like the mushroom growth of to-day, offered a rich field for the operation of stock companies. Promoters not over-scrupulous, who exist and grow fat by virtue of the credulity and greed of speculators, invariably find dupes to act upon.

Speculating fevers, booms and rushes are detriments to all honest industry. Haste to accumulate the root of all evil kills useful work and disheartens the thorough mechanic. Schemers make victims of capitalists and inventors, and the collapse which follows as sure as the wake of a boat, is detrimental to the industry. It casts a shadow over good inventions and prejudices the public against motor vehicles.

It may be well to recall this promotion period in England and not repeat the error at this late day.

Aside from the floating of companies with worthless patents, the new law for an unjust toll tariff on steam carriages was not the quality of encouragement to offer a new industry.



Hancock's Model, 1833.

J. Scott Russell built a car in 1857 which was run on the turnpike with success. It had a seating capacity for 12 passengers. It was run through England to Scotland, but was finally destroyed by the machinations of the turnpike company.

James built a steam car in 1834, which was the first four-cylinder car ever run. Two cylinders were constructed to each wheel.
Caithness in 1861 drove a Ricketts machine 150 miles through a Scotch mountain district in two days, without any mishap. The disappointment of many mechanical engineers was keen. They faced the situation however with the mental attitude of philosophers.

Hill's carriage was fitted out with a compensating gear. Successful trips were run from Camberwell to Brighton and return in one day, but the objection found with Hill's carriage was that too much time was lost in stopping to fill the water tanks.

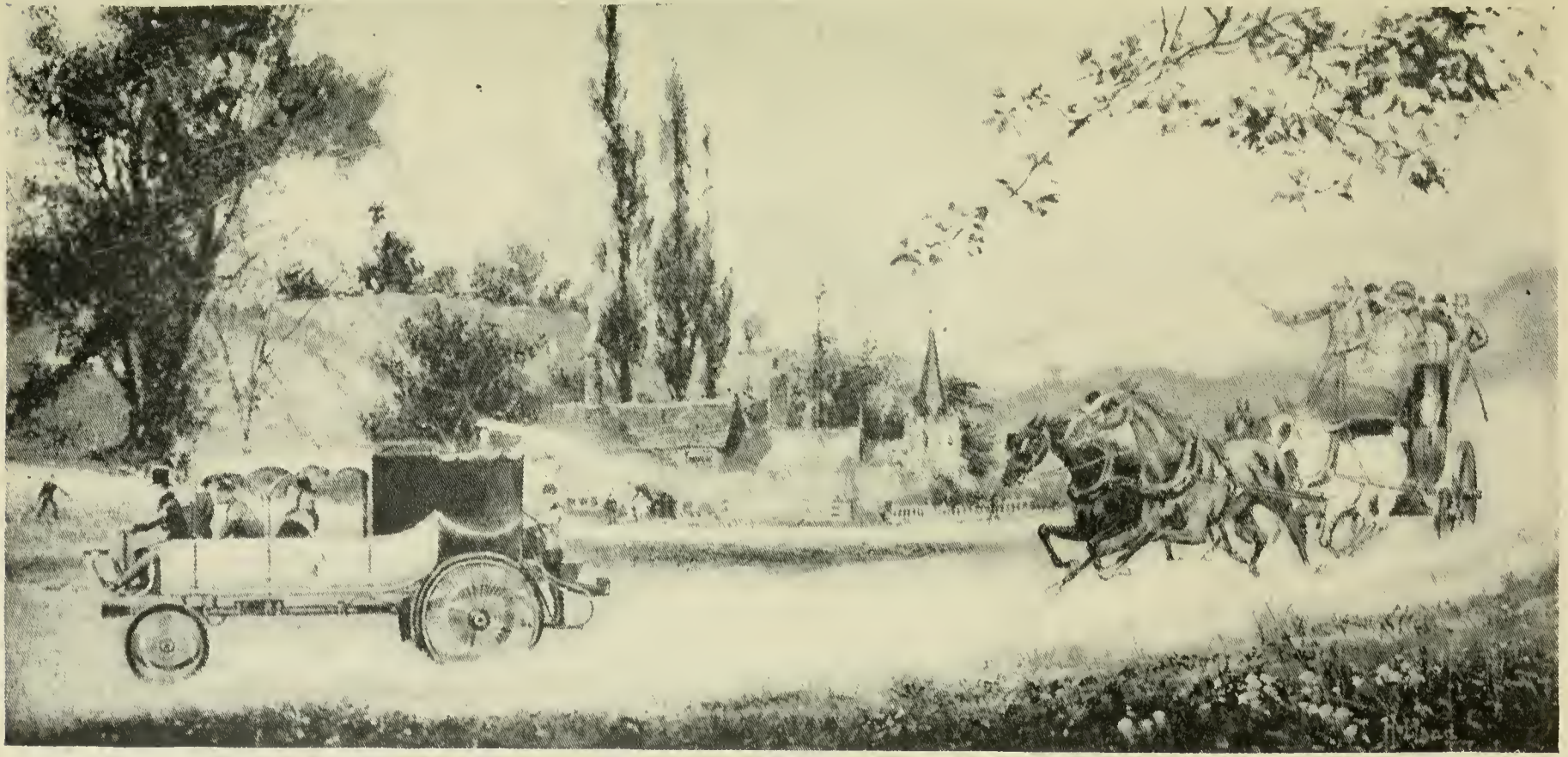
The first car to have the front steering wheel and rear wheels driven by gear was built by F. Hills, of Deptford, England. He drove the car 25 miles an hour in 1840.

Carrett, of Leeds, built and ran a car successfully in 1861. It was sent to the London Exhibition in 1862. An automobilist purchased the car in 1865 and drove it nights over 800 miles in Kent.

Hancock's Coach, 1833.

The minions of the law "laid" for this "scorcher" who drove his Fly-by-Night and made a breach of the Locomotive Act. This enthusiastic automobilist altered his car to resemble a fire engine and furnished his passengers with brass helmets, represented them as firemen and ran his car. Where there is a will there's a way to break it for a while. He eventually gave up nocturnal scorching. Perkins built a three-wheel automobile in England in 1873 following somewhat the Cugnot idea of construction, but the results were disappointing. Mackensie built one there the following year. It had two speeds, and a two-cylinder steam engine. A sprocket chain gear was used for propelling the machine. Dr. Church, of Birmingham, built a coach to carry fifty passengers which was run on three wheels. The 'bus after a few trips from London to Birmingham was discontinued. George Stephenson predicted that "steam carriages on ordinary roads would never be effective or at least sufficiently serviceable to supersede horse carriages." But it might be noted that he was heavily interested in railroad stocks.

Anderson, an engineer, of Manchester, built a road locomotive for hauling 'busses in 1858. It ran on three wheels and at a speed of eight miles an hour. Boulton built a steam road engine about the same time which ran ninety miles in one day,



A Race on the Turnpike in the Days of Yore.

and that was allowing for frequent stops for water. These engines were entered in a race in 1867. The Boulton machine carried ten passengers

The Yarrow & Hilditch steam carriage built in 1862 and placed on view in the London exhibition had a vertical multitubular boiler. The seating capacity was for thirteen, which may have been made to break the spell of that lucky (?) number or test it. The machine weighed 2½ tons and the rear wheels were driven directly by the engine; the connecting rod was fastened by a crank pin on the outside of the wheel.

J. H. Knight built a steam carriage in 1868 and a steam wagonette was constructed by Catley & Ayres, of York, in the following year.

R. W. Thompson, who invented the pneumatic tire in 1846, gave his attention to steam carriages and in 1867 invented a "road steam," which was run on solid rubber tires. The machines were in great demand and some were exported to India.

Engineers in Scotland were studying the principles of automobiling and many cars were run from 1860 to 1875. A steam 'bus was operated on a line from Edinburgh to Glascow in 1870. It weighed seven tons and held fifty passengers. Its speed was 16 miles an hour. A mail and passenger coach was constructed by Todd, of Leith, in 1872. The vehicle was put in commission from

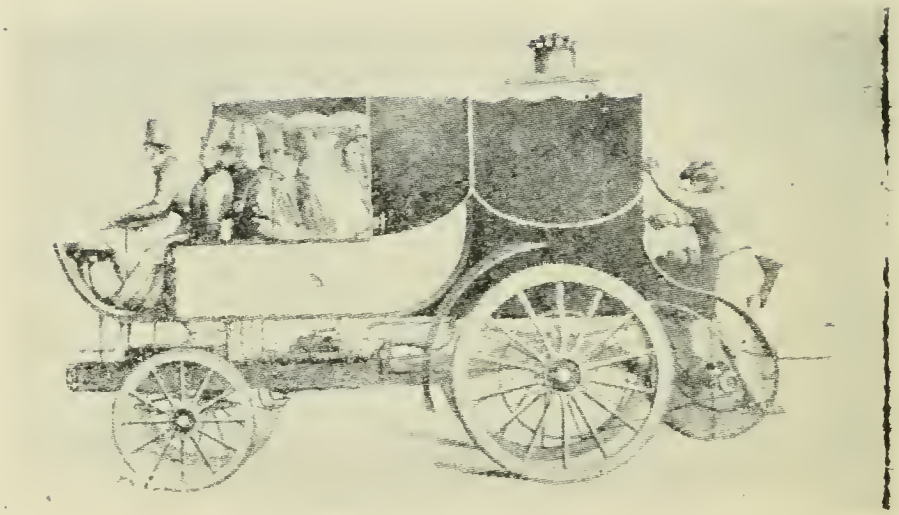
City of London to Paddington Village and Return, 9 Miles in 55 Minutes.

Gurney's Touring Coach, 1833.

Leith to Edinburgh. In the same year a handsome carriage was built by Charles Randolph and was run about the strets of Glasgow. It was fifteen feet in length and was under excellent control. The car ran six miles and could be stopped in its own length. It could be turned in a street forty feet in width. Six passengers were comfortably seated in the enclosed body and three on the driver's seat. The car weighed 4½ tons, and emitted no steam or smoke. Randolph presented it to the South Kensington Museum.

Mackenzie, of Norfolk, England, constructed a three wheel machine in 1874. It had a two-cylinder vertical engine in the rear which was connected by a two-speed gear to the carrier wheel of a compensating gear on the counter shaft from which motion was transmitted to the rear wheels by chains. Blackburn built a dog cart in 1878; it had a three-cylinder engine. Inshaw's vehicle was built in the style of an Irish jaunting car.

Sir Thomas Parkyns invented a steam tricycle in 1880 and perfected it. The machine was exhibited in the Stanley show aat Islington and many orders were received by the maker. The old Highway Acts were still in force and he made a test case, claiming that a tricycle was not known when the law was made, but the magistrate before whom he appeared decided that it came within the word-



Maceroni & Squire's Coach, 1833.

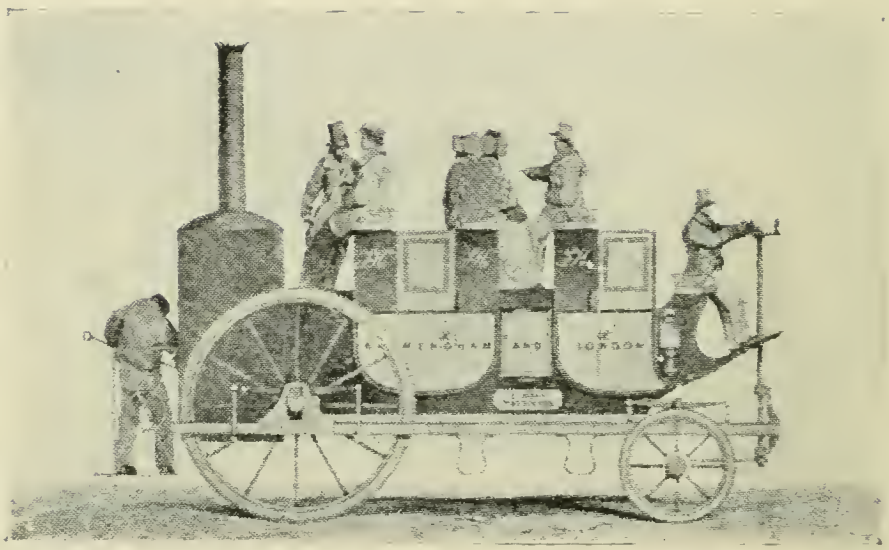
ing of the law, and that Sir Thomas "made a breach of the Highway Acts in using a carriage propelled by steam or other than animal power at a greater speed than three miles an hour unprotected by an attendant ahead carrying a red flag."

Randolph's carriage, which was built for his private use, ran at the speed of six miles an hour on the streets of Glasgow in 1872.

Inventors were at work on a liquid fuel car in the United States about the same time as Benz and Daimler were in Europe. In 1878 Henry D. Selden, of Rochester, N. Y., applied for a patent on a horseless carriage. A model was built and ran on the streets of that city, which was described as a freak machine. He filed amendments each year to his application which was granted finally in 1895. The patent rights were taken over by the Electric Vehicle Company of New York. That company brought suit for infringement against a number of manufacturers in the United States and it was settled by a pooling of interests in the spring of 1903.

Source of Steam.

The practical motor in use up to 1880 for propelling vehicles was the steam engine. Its power was demonstrated in many carriages in England, America and France. The power of steam was known many centuries ago and was employed



Hill's Steam 'Bus, 1840.

in place of man and horse power in mines, mills, building and for transportation on land and sea.

Looking back into the history of steam we learn that its power was known to the Egyptians. Hero, a Greek mechanical engineer, records the use of steam the third century before the Christian era. Many historians have called him the inventor of steam. He was a learned writer of the Socrates' school of thought and enjoyed a life of study and research in Alexandria, that powerful old city of Egypt. Hero was a student at the renowned library there and a contemporary of the philosopher Archimedes. In the British Museum is deposited a book written by Hero wherein he states the power of steam was known in his time. He describes the primitive devices for generating steam in a Ball of Aeolus, which he terms Aeolipile. It was an enclosed ball full of water. A fire was kindled under it, and steam was generated. Egyptian priests employed steam for effect in their religious ceremonies.

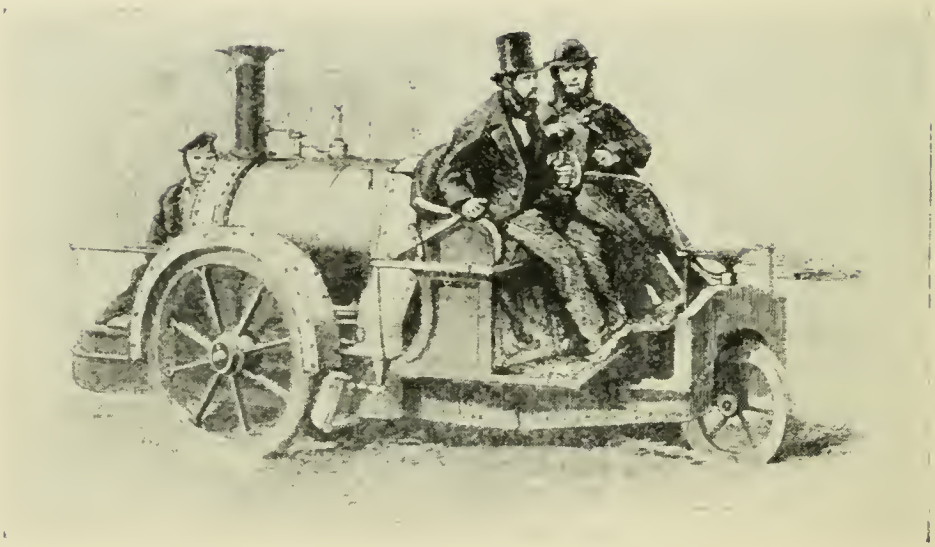
A clever device of Ctesibus is described for opening the temple doors by mechanical power. The great statue of Memnon had within it concealed vessels of water which were acted upon by the sun's rays. The steam passed through inner tubes which emitted sounds. Fancy the effect of this god's unintelligent murmurings on a credulous populace knowing little or nothing of the princi-

Hancock's Carriage, 1836.

ples of steam power. Knowledge at that time was held secretly sacred from the public.

The aeolipile described by Hero is practically the primitive basic principle of steam locomotion to-day. Many years passed before steam is mentioned again. In the twelfth century William of Malmesbury records the description of steam power used for tolling the bells of the great cathedral at Rheims and for pumping air for the grand organ in the edifice. Four centuries pass and the flickering light is not allowed to go out. In the sixteenth century there appears to be an awakening interest in mechanical devices and man begins to realize that he may gain a vast power over Nature. The investigation going on at that time was not confined to any particular country. The inventor of the Camera-obscura, Baptista Portia, a Neapolitan, in 1606, used the aeolipile as a steam engine and succeeded in pumping water. Solomon De Caus, of Normandy, in 1615, invented an engine, under the patronage of Louis XIII.

In some old Spanish records an account is given of the first steamboat. Blasco de Garey, a Spanish inventor in 1543, under the favor of Charles V., who was attended by Prince Philip and many noblemen, constructed a vessel of boiling water in a boat of 200 tons. The device had attached to it movable wheels on each side and was given a practical demonstration in the port of Barcelona, where it successfully propelled the boat. For



Ricketts' Car. 1861.

some unknown reason de Garey took his mechanism away. The boat was placed in the museum.

Nearly one hundred years later a general intelligence was directing the half developed knowledge of steam and was formulating principles. Lord Bacon in 1620 declared that he believed heat was power, although no one was certain of it at the time.

Four years later an ingenious young Frenchman, Sadi Carnot, wrote that "wherever there exists a difference of temperature, motive power can be produced." The principles of motive power were gradually being understood and aggressive men in several European countries were constructing devices and experimenting with mechanical contrivances.

Giovanni Broncas, an Italian chemist, at Rome in 1629, invented a steam engine that was used for pounding drugs. In the sixteenth century Leonardo da Vinci invented a steam gun. Inventors were overcoming the existing prejudices somewhat, for Bacon writes about this time, that "inventions seemeth to be the chief of all human actions, political achievements can respect but some cantons of men; inventions make all men happy."

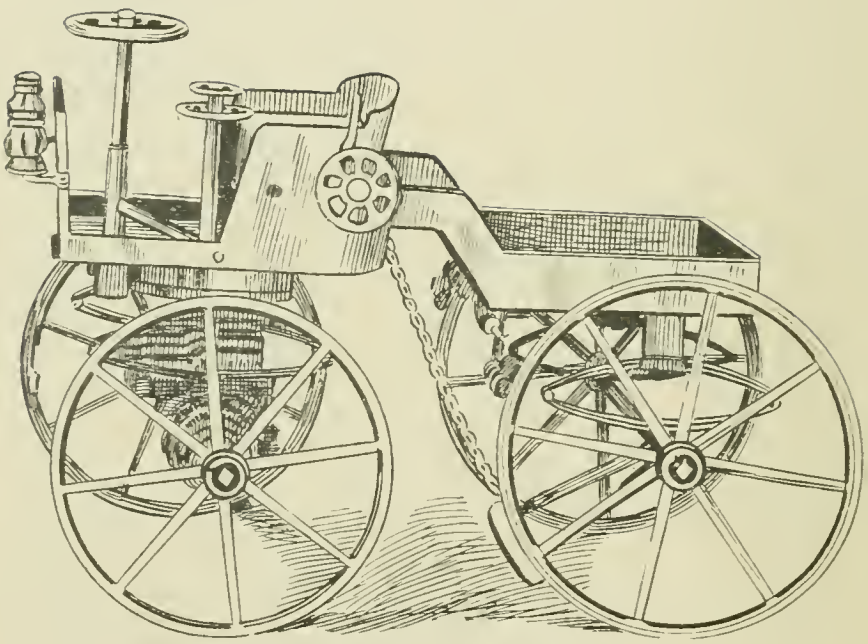
One of the sights in London in the latter part of the seventeenth century was an engine which pumped water. It was the invention of the Marquis of Worcester, and he concealed the plans of

Randolph's Steam Coach. 1872.

his device. Worcester wrote about his pump afterwards as follows: "I gave forth prayers of thankfulness when my mortal eyes beheld the wonderful invention." Its fame had spread abroad for Cosmo de Medicis, the Grand Duke of Gascony, while traveling in England instructed his secretary to note it in the objects to be seen. The secretary's note book has the following entry:

May 28, 1699.—"Visited the wonderful Worcester engine which was working in London near Vauxhall beyond the Archbishop's Palace of Canterbury." All of the experiments in the past are units that formed a basic work for the knowledge of power which has been handed down from generation to generation, augmented by each. Today is the sum total of the past.

John Stuart Mills said in reference to mechanical inventions that: "Of all the features which characterize this progressive economical movement of civilized nations, that which first excites attention through its intimate connection with the phenomena of production is the perpetual and so far as human foresight can extend, the unlimited growth of man's power over Nature. Our knowledge of the properties and laws of physical objects show no signs of approaching its ultimate boundaries; it is advancing more rapidly, and in a greater number of directions at once than in any other previous age or generation, and affording such frequent glimpses of unexplored fields beyond as



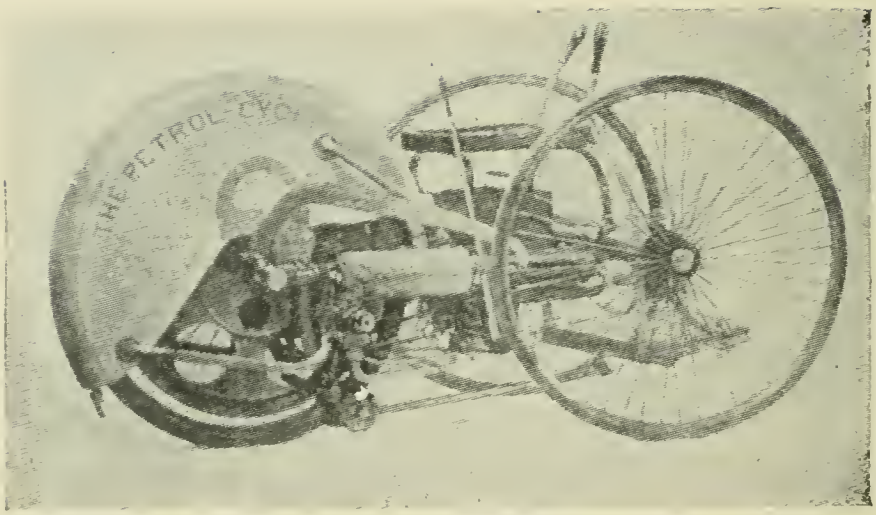
Selden's Model, 1878.

to justify the belief that our acquaintance with Nature is still almost in its infancy."

The steam car was making a record for itself. Some of the models held a record of 25 miles an hour, but the inconvenience of frequent stops for water was a defect pointed at by rivals. The puffing smoke and discharging steam were objectionable to passengers.

The stepping stone from the fields of achievement of the past to the wonderful scenes of to-day was the introduction of internal combustion. It is produced by expansion of gases which are mixed with air and ignited within the body of a cylinder. This system displaced the grate fire and will in all probability be adopted by traction engines in the near future.

In England, Meek of the firm of Toward & Co., Newcastle-on-Tyne, built a steam tricycle in 1877 and Parkyns built a tricycle three years later in which he used methylated spirits to fire the boiler and later petroleum spirits or gasolene. The liquid was fed down a cluster of small pipes to a bunsen burner with a fan blast. All or part of the burners were kept alight as required. The engine employed a pair of small double-acting horizontal cylinders $1\frac{1}{2}$ inches in diameter and $3\frac{1}{2}$ inches stroke, with ordinary slide valves and excentrics. The engine had one speed and no reverse. For running this little machine on the highway Meek was arrested. A new law was enacted in 1896 entitled



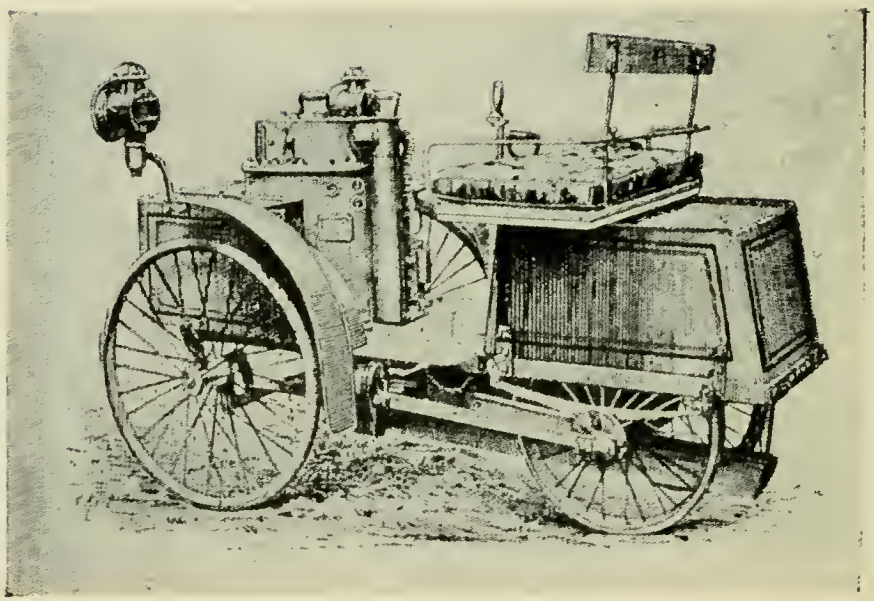
Butler's Cycle, 1887.

the Light Locomotive Act, which allows the modern automobile some privileges on the roads.

The bicycle, that harmless little two-wheel toy, was the means used by evolution to upset the strongest prejudices and to break a narrow hide-bound conventionality during the years from 1880 to 1900. It led to agitation for better country roads and when the small portable steam engine was developed, the little vehicle was experimented with first, gradually the tricycle, then the light runabout and finally the modern touring car.

Sylvester Haywood Roper, of Roxbury, Mass., had been experimenting with steam in 1850, and at the age of 73, he applied a miniature engine to a Columbia bicycle in 1882. It had a small grate fire to generate steam. The bicycle ran seventy miles on one charge of fuel. The whole machine weighed 165 lbs. He entered a race in 1898 against the English Butler brothers' tandem on the Charles River track, Boston, where he died suddenly. Roper's record on the track was three runs of 1-3 mile each in 42, 39 and 37 seconds.

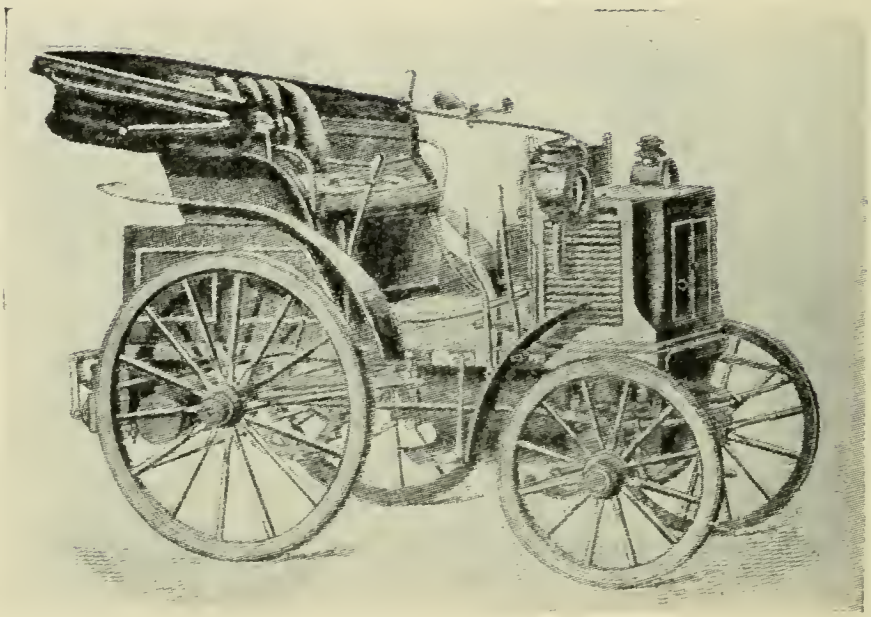
George E. Whitney, of Boston, designed a vehicle similar to Roper's steam carriage. He employed liquid fuel and the main features of the motor power were employed in the production of several companies formed in the New England States. The construction of machinery on cycles tended to devices of compactness. Butler's tricy-



De Dion's Steam Carriage, 1889.

cle had an engine fired by liquid fuel in 1884. The two front wheels are steering wheels and the rear wheel is driven by a two-cylinder engine. It weighed 280 pounds. Butler wrote in the English Mechanic, December, 1890: "The autnorities do not countenance its use on roads, and I have abandoned in consequence any further development of it."

Leon Serpollet, a French mechanical engineer, had been at work on a steam engine for automobiles in the early 80s. He built an instantaneous generator three-cylinder engine for Le Blant's carriage. The vehicle carried nine passengers and weighed 3½ tons. The machinery was in the rear of the car. In 1888 he built a steam tricycle and the following year he built a steam carriage to seat seven persons. It had a two-cylinder horizontal engine and was run on three wheels. He drove the car from Paris to Douai, one hundred and forty-four miles at a maximum rate of twenty-five miles an hour, which he considered very speedy. April 7, 1903, he drove one of his latest cars one kilometer in 29 1-5 seconds. The fatal accident to Count Zbòrowski just previous to this test so affected him that he stated he would never race again. But he probably will later. The cycle boom was at its height in 1888 when Serpollet built a number of light steam carriages. One was exhibited at the Paris show in 1900, and was purchased by the King of England.



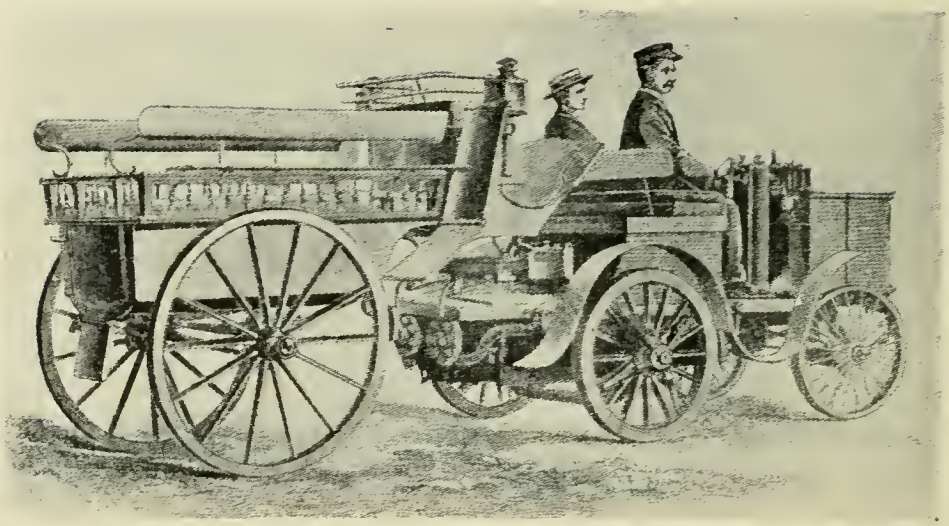
Panhard et Lavassor Dog Cart, 1891.

The Serpollet steam engine is supplied by water in small quantities as it is needed. The steam is generated immediately and it is termed an instantaneous or flash boiler. The engines were run first by a grate fire; this was supplanted by liquid fuel. Kerosene is supplied to a number of small burners under the boiler.

Electric Vehicles.

When electric vehicles are mentioned it conveys the general idea that the invention is a product of the past few years. While it has not the ancient family history and record of the steam class yet it has associated itself with prominent men of the past. Davenport, a Bandon, Vermont, blacksmith, constructed an electric car on a circular railroad in 1836. It was exhibited at the London Exhibition in 1838. But Sturgeon, an Englishman, had one working there a year before the Yankee car went abroad.

Botto, an Italian, also was experimenting with an electric car in 1837. The first car built which was practical was in 1839. It was built by Robert Davidson, a Scotchman, of Aberdeen. After three years of experimental work it was given a trial run of the railway from Edinburgh to Glasgow. The result was not entirely satisfactory. Uriah Clark, of Leicester, constructed an electric car in 1840, and George Little in 1841. In America M. G.



De Dion-Bouton, Paris-Rouen Contest, 1894.

Farmer built a track motor in 1847. He was followed by Page, of Baltimore, in 1850, and Hall, of Boston, in 1857.

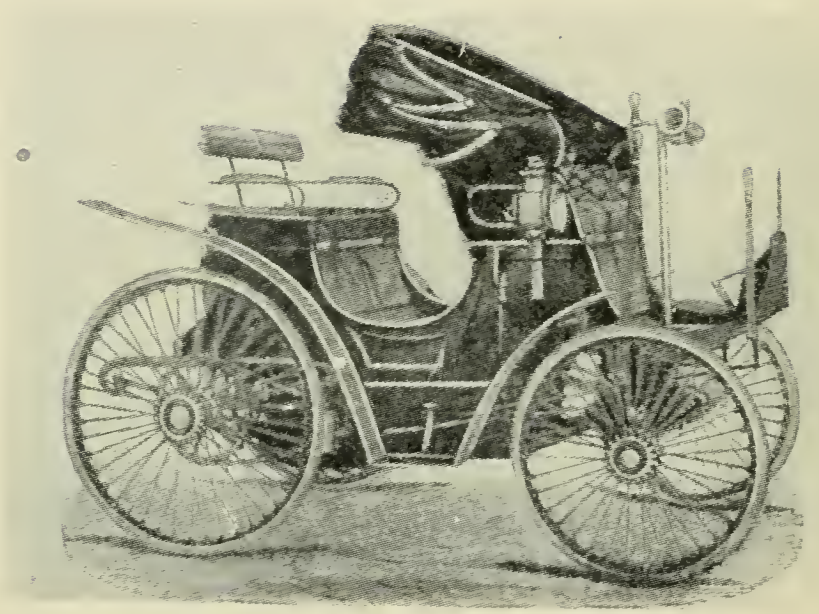
Electric tram cars were successfullly operated on the Parisian boulevards in 1880 by a French company. The company also made electric bicycles in the same year. Aryton & Perry brought out an electric bicycle in England during 1882.

Electric cabs were put in commission at Brighton, England, by Ratcliffe Ward in 1887, and the following year they were introduced into London, running at a speed of 7 miles an hour. Volk, of Brighton, built an electric dogcart for the Sultan of Turkey in 1888. A six seated phaeton, built by Pouchain, of France, in 1893, proved to be a practical carriage.

About 275 patents were taken out in this country for inventions of motor power and running gear during the period from 1800 to 1880.

All the early models have disappeared. It seems strange that no effort was made to preserve them. They were all driven by the engines direct, coupled to the crank shaft axles, except the Hancock cars.

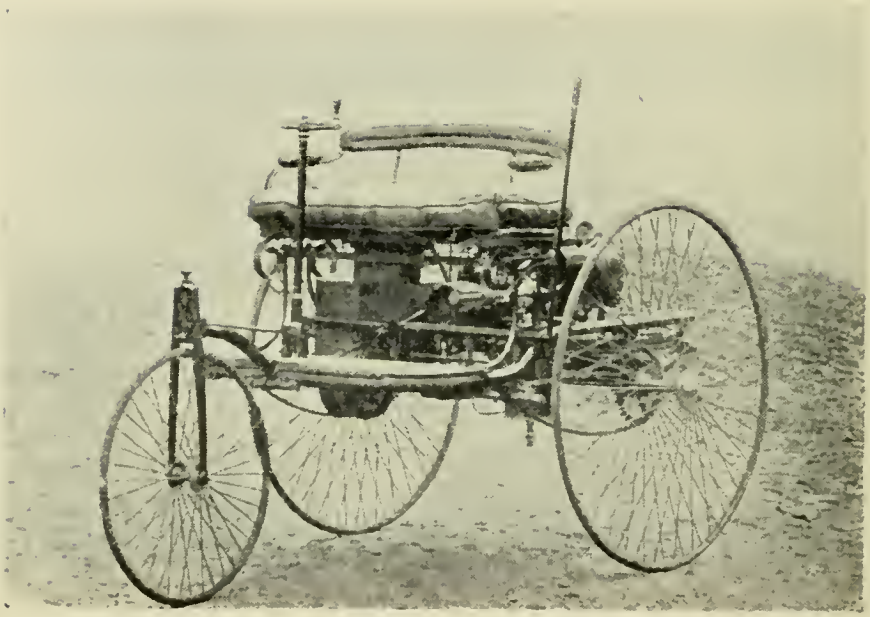
The spirit of progress may suffer fads and follies to tantalize during their brief existence, but it is up in arms against restriction. Progress loves liberty. Where the shackles of restraint are broken, there the wonderful spirit will seek its abode to lighten the burdens of mankind and help to give



Peugeot Gasolene Automobile, 1895.

comfort and happiness. When a nation is not equal to the development that seeks admission it must stand aside and give place to the progressive state. There is a tide in the affairs of a nation as well as man which taken at its flood leads on to victory. England with her conservative element in the majority was not equal to the progress that was at her door and the automobiling industry waned. Her laws and turnpike companies drove it out. France was the country destined to revive automobiling on the highway.

The first patent granted in the United States for an electric automobile was to L. W. Coe in 1872. Eleven years passed before the next patent was granted to E. Fox for an electric engine. C. A. Faure received one in 1888. An ice-cutting machine and electric cycle patents were taken out by F. E. Kinsman in 1889. W. P. Perry invented an electric velocipede in 1889. W. Jasker and R. J. Fleischer were granted patents the following year for velocipedes. M. W. Dewey invented an electric fire engine in 1891. D. Madden and F. Gardner were granted patents for electric vehicles in 1892. Only one patent was issued in 1893 for a vehicle to J. W. Moelker. C. G. Anderson invented an electric drive wheel for any vehicle in 1894. Rogers & Fracker invented a vehicle machine the same year. In 1895 H. C. Baker, H. W. Libbey



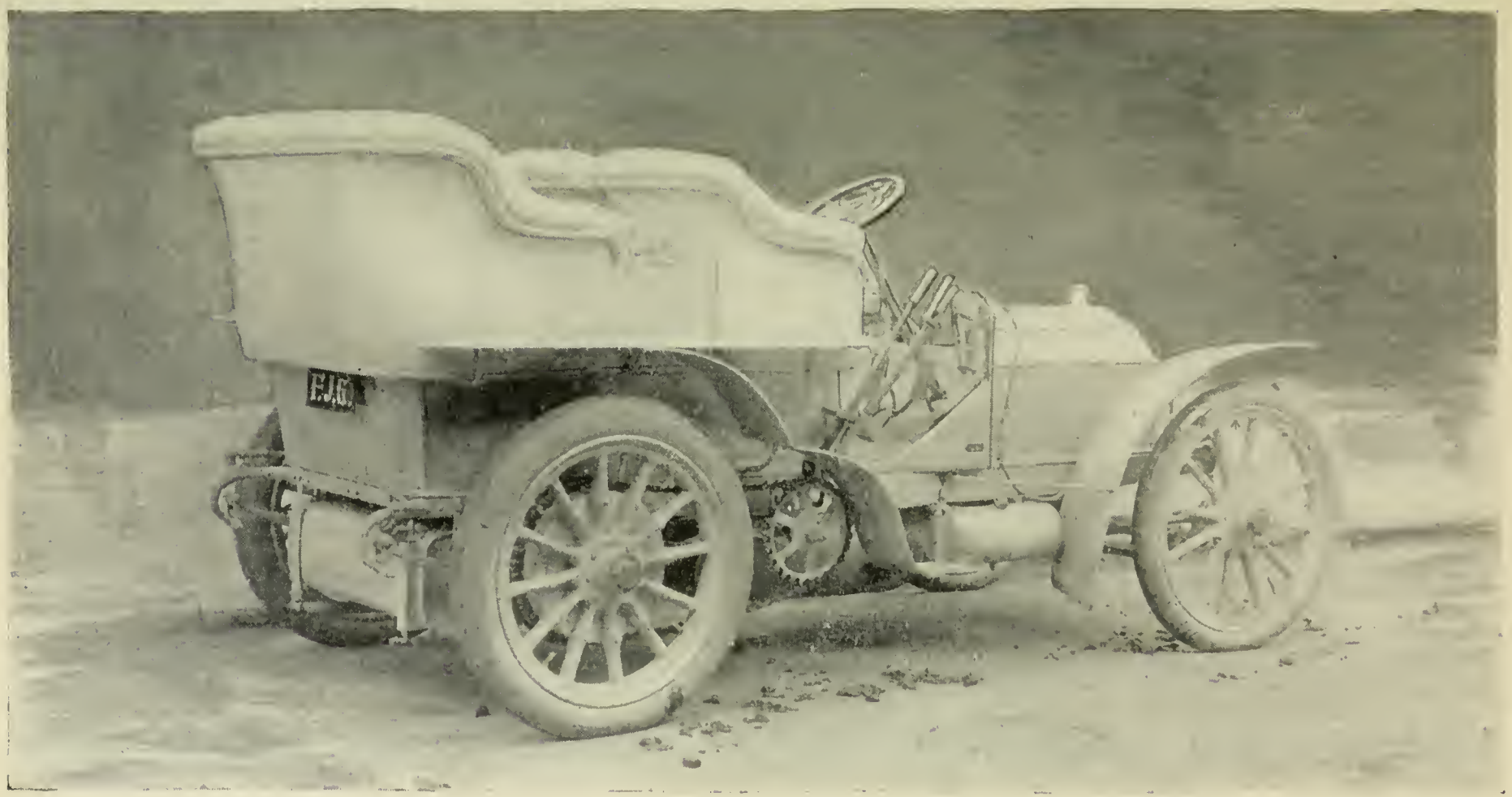
Benz Tricycle, 1885.

and O. Bolton, Jr., received patents on bicycles. The Morris and Salom patents were issued in 1895. During 1896 C. Theryc invented a motor hub of wheels and C. H. Burrows took out a patent for a vehicle. Five were granted in 1897, one to H. W. Libbey for bicycle and four for vehicles to C. E. Wood, K. Knudsen, G. H. Grenlich and H. P. Maxim.

Compressed Air.

Compressed air was hailed as the solution to the problem of transportation. The first engine to be propelled by air was built by George Melhurst at London in 1799. Interest waned until 1827, when Mann, of Brixton, England, wrote a pamphlet and made a sketch of a coach to be driven by air. It turned out to be a project, only air and nothing more. Another revival occured in 1840 when Andrand & Tessie dul Motay built a car in France which was propelled by compressed air. It ran on rails and carried eight passengers. What the future holds for the compressed air means of locomotion is a question. A French firm built a parcel delivery wagon and made a practical test in 1899. It will not be surprising to hear more from this class of vehicles in the future.

Over fifteen patents for compressed air vehicles were granted in the United States. In the statistics compiled by the government dating from 1789 to 1899 the names of patentees and dates of issue



MR. F. J. GOULD'S 45-Horse Power Mercedes-Simplex; cost $22,500.

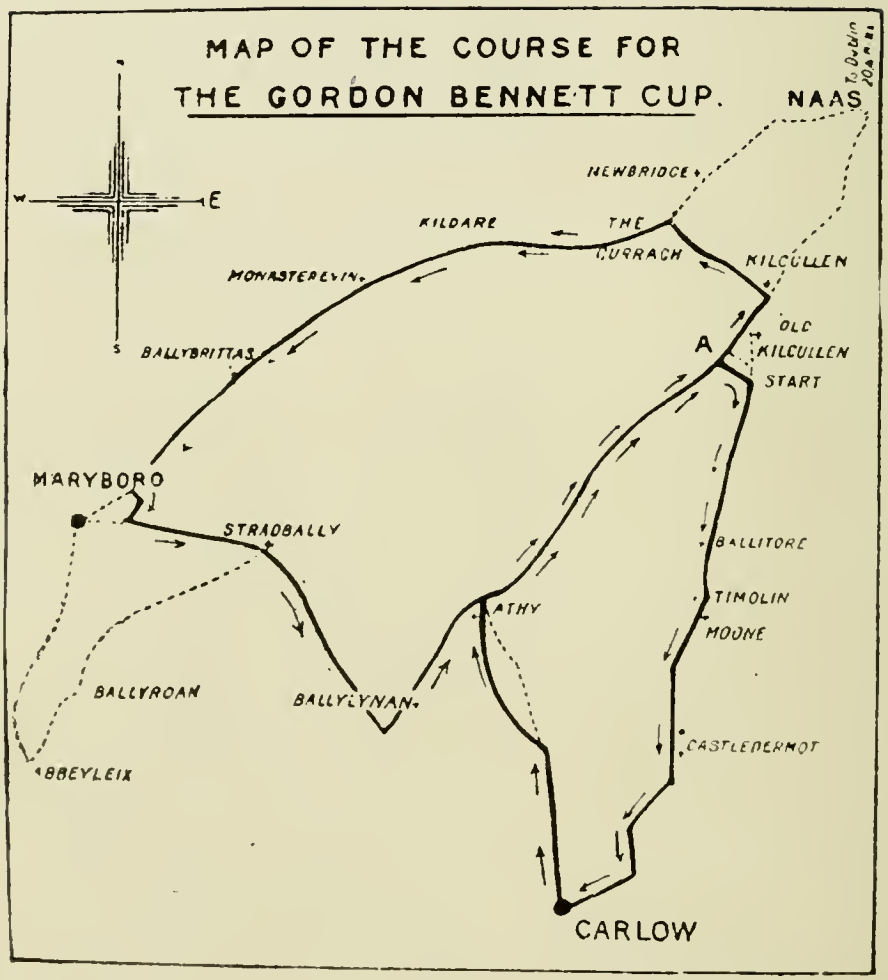
are as follows: J. Griscom, 1874, vehicle; C. W. Potter, 1883, vehicle; D. S. Troy, 1884, vehicle; C. E. Buell, 1885, velocipede; T. Cummins, 1893, cycle attachment; J. Kames, 1893, mechanism for street car; G. Keller, 1893, motor; G. Ducand, 1895, motor; C. H. Bellamy, 1897, cycle; D. A. Moore, 1898, cycle; E. A. Cozens, Hansard & Hiatt, E. E. Eyster, H. Symes and M. Schmidt, 1898, cycles.

Growth of the Industry.

The output in this country two years ago was less than 5,000 machines by 109 houses at a gross value of $4,889,443. The number of vehicles made during 1901 was about 10,000 and the value of the output was estimated at $10,000,000. The increase for last year was about 100-fold and this year the manufacturers will probably turn out machines to the value of $25,000,000. Over 50,000 vehicles are now in use in this country.

French Industry.

Many influences were at work about 1860 to give the automobiling industry a healthy growth in France. The English roads were consecrated to the horse. Excessive toll rates for steam propelled vehicles were followed by a new act of Parliament, limiting the rate of speed on country highways to four miles an hour and in towns to the ridiculous limit of two miles an hour. A man waving a red flag was required to precede the car.


MAP OF THE COURSE FOR
THE GORDON BENNETT CUP.
To Dublin 20 miles
NAAS
NEWBRIDGE
KILDARE
THE CURRAGH
KILCULLEN
MONASTEREVIN
BALLYBRITTAS
A
OLD KILCULLEN
START
MARYBORO
STRADBALLY
BALLITORE
TIMOLIN
MOONE
ATHY
BALLYROAN
BALLYLYNAN
CASTLEDERMOT
ABBEYLEIX
CARLOW

Macaroni's steam cars were successfully driven from London to Brighton at a speed of 18 miles an hour. Vehicles were built and shipped to Belgium and Paris in 1835. He was handicapped by the proverbial barrier of all inventors—lack of capital—and he was hounded by his creditors.

A company was formed in Paris in 1835 and Macaroni's patents for France were purchased. Macaroni was defrauded of the proceeds by his agent.

Pecquer constructed a steam carriage in France about 1828. Six years later an eight wheeled drag was built by Dietz. Many of the French mechanics' were interested in the steam road locomotion problem. Galy-Gazalet, Hammond and Leroy built carriages and demonstrated them with more or less success.

The industry at this time was at the dawn of its wonderful growth. Paris was the most isolated city in Europe. The 'busses crawled like snails and the cabmen would only hire for a limited distance. Transportation about town was nearly as poor as the "L" road in New York City, has been here during the winter of 1902 and 1903. Parsians hailed the innovation. The highways were open for speeding and the industry was encouraged.

The revival of self-propelled vehicles on the highway began in France about 1865. The Lotz Com-

The Gordon-Bennett Course on Maryborough Road, Ireland.

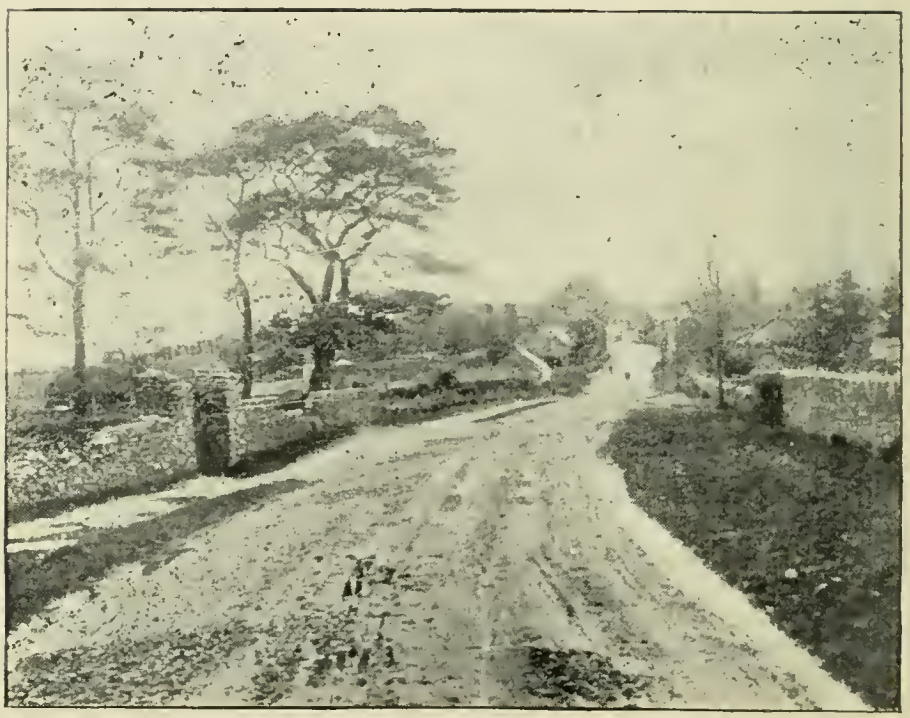
pany, of Nantes, France, developed a large business in building traction engines, and the company constructed an engine in 1865 to haul a 'bus at that place. Several 'bus lines were in operation at that time; one from Paris to Joinville le Pont was carrying passengers in 1869. Amedee Bollee began in 1873 to construct steam carriages which were very successful. An omnibus built by him in 1880 was entered in the Paris-Bordeaux contest in 1895, and was the only steam vehicle to complete the course. At Rouen in 1876 one of his machines was used for omnibus service and two years later he constructed a steam runabout that was driven from Paris to Vienna. The gasolene car of to-day is built on lines similar to the Bollee steam runabout. A speed of 22 miles an hour was attained on level roads. A vertical engine was placed in the front of the carriage. A bevel gear connected the transverse shaft to a longitudinal transmission shaft. A differential gearing transmitted by chain the motion to the rear wheels. The boiler was in the rear of the vehicle. Leon Serpollet made a great advance in highway transportation when he built a tricycle with a flash boiler engine in 1889. This was the forerunner of the Serpollet steam automobile.

The advent of the internal combustion motor soon gave a new phase to self-propelled machines.

A Straight Stretch on the Gordon-Bennett Course, Ireland.

and gave a further impulse to its use as a pleasure and commercial vehicle. As early as 1859, Etienne Lenoir, a French engineer, invented a gas engine which displaced a bed of live coal. The theory was further demonstrated by Beau de Rochas, another French engineer, who laid down conditions which, to him, were essential to its success. He believed in the largest cylindrical volume with the smallest circumferential surface; the maximum speed of piston; the greatest possible expansion, and the highest pressure at the beginning of the expansion. One cylinder would produce these results.

A German, Gottleib Daimler, born at Schorndorf in 1834, was destined to become an important factor in the development of automobiling. He was a practical mechanic. After working in England some time he returned to Germany and was employed by the Otto Gas Engine concern in 1885. He constructed an engine to be run by liquid fuel. Carl Benz, of Mannheim, was also experimenting with gas engines in 1886. Daimler and Benz were the first to apply the gasolene engine to road vehicles. They built a tricycle and runabout in 1886 on the principles of the motors used to-day. Gas engines were not practical as the fuel could not be transported and when gasolene was experimented with the problem was solved. The Daimler engines were used in the construction of vehicles built by Panhard and Levassor at Paris in 1891. Panhard



Gordon-Bennett Course Near Timolin, Ireland.

and Levassor secured the patents rights of the Daimler engine for Belgium and France in 1889, and two years later they turned out a new car of $1\frac{1}{2}$- horse power.

The Benz motor was adopted in vehicles made by M. Rogers of Paris in 1892. The power was transmitted from a crank shaft to a counter shaft fitted with compensating gear by means of belts and pulleys arranged to give two speeds, three and twelve miles an hour. The carriages were comparatively free from vibration. A 4-horse power engine was built in a racing car which entered the Paris-Bordeaux races in 1895.

Motors are worked by hydro-carbons from alcohol, petroleum, gasolene, benzine and illuminating gases. The common fuel used in American cars is gasolene. Alchohol is employed in French and German cars to a great extent. The tariff on it makes it too expensive a fuel for use in this country. Petroleum or kerosene will probably be the coming fuel here on account of its cheapness and safety, besides it may be purchased in any village or country store.

LeFils de Peugeot Freres, of Valentigney, France, near the borders of Switzerland, built a gasolene car in 1890. The firm had previously been giving attention to the construction of steam cars with the Serpollet engine. When Armand Peugeot first saw the Daimler engine in a Levassor car, he

The Gordon-Bennett Course Near Marborough Heath.

decided to construct gasolene vehicles. One of the new model cars was driven 1,000 miles and entered a vehicle contest held at Paris in 1891.

The contest was organized by the proprietors of Le Petit Journal, Paris, for bicycles and the Peugeot car followed the course. It attracted much attention, and demonstrated that transportation on the highways by self-propelled gasolene vehicles was a practical thing.

In 1882 Baron De Dion met Bouton at Paris. The subject of mechanical transportation was discussed and it changed the current in De Dion's life. A shop was built at Suresnes and for two years these men worked on a boiler. The result was a cycle propelled by machinery. It weighed 1 cwt., and was run 18 miles an hour. The French highways were free for demonstration and what wonder that the development was rapid. Horse 'busses about Paris were running at the speed of one mile in twelve minutes and the cabs could not be engaged for long distances.

Most of the mechanically propelled vehicles were heavy steam omnibusses weighing over three tons and the need was for a lighter carriage. Automobiles became popular in France before the manufacturers had constructed practical machines. Ever eager for advancement the French people are awaiting for aerial navigation to-day. They were enthusiastic over the first cars made by Serpollet, De Dion and Bouton, and Panhard and Levassor.

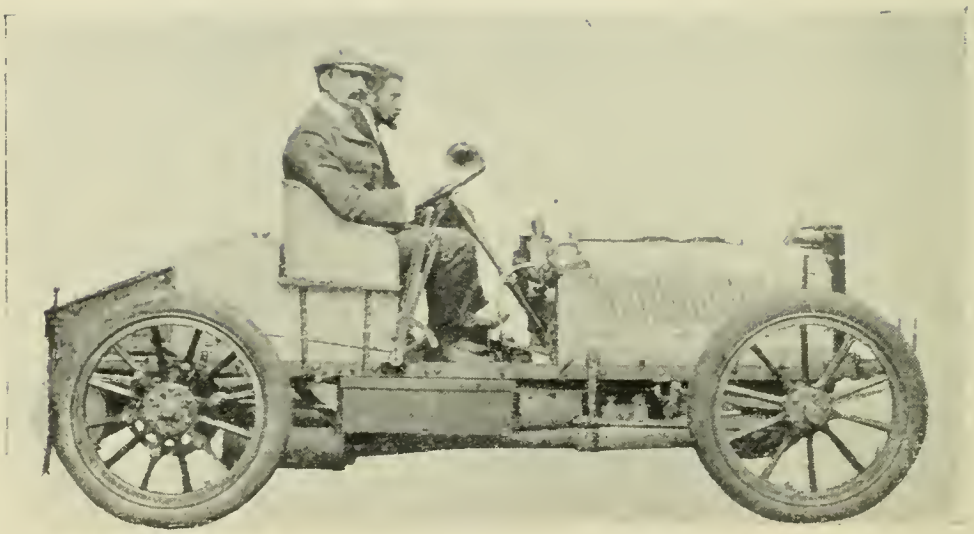
Edge's English Napier, Cup Defender, 1903.

The prominent French cars were the Panhard & Levassor, Peugeot, Renault, Delahaye, Mors, Gobron-Brillie and Gardner-Serpollet (steam).

The German cars were the Benz, of Mannheim, and the Daimler of Cannstatt.

The Peugeot Brothers, of Paris, were practical engineers and the construction of engines was a branch of the business that attracted their attention. The steam engine was the one that they started to experiment with and they changed when one of the brothers saw what the Daimler motor was destined to perform. They built a little runabout in 1891 and it was shown at the bicycle races from Paris to Brest in 1891. It was a 2-horse power motor and the carriage was geared to give four speeds—three, six, nine and twelve miles an hour. It had seats for four persons. They have since made an improved type of motor and their cars are among the high priced, swift touring cars that rank foremost among the best European make.

One of the foremost and well known motors of to-day is the De Dion. De Dion and Bouton took up the old line of investigation, the steam engine, in 1883. The following year they built a tandem tricycle and placed the motor and generator in the position of the rear seat. It was a 1-horse power motor and made an initial run of eighteen miles

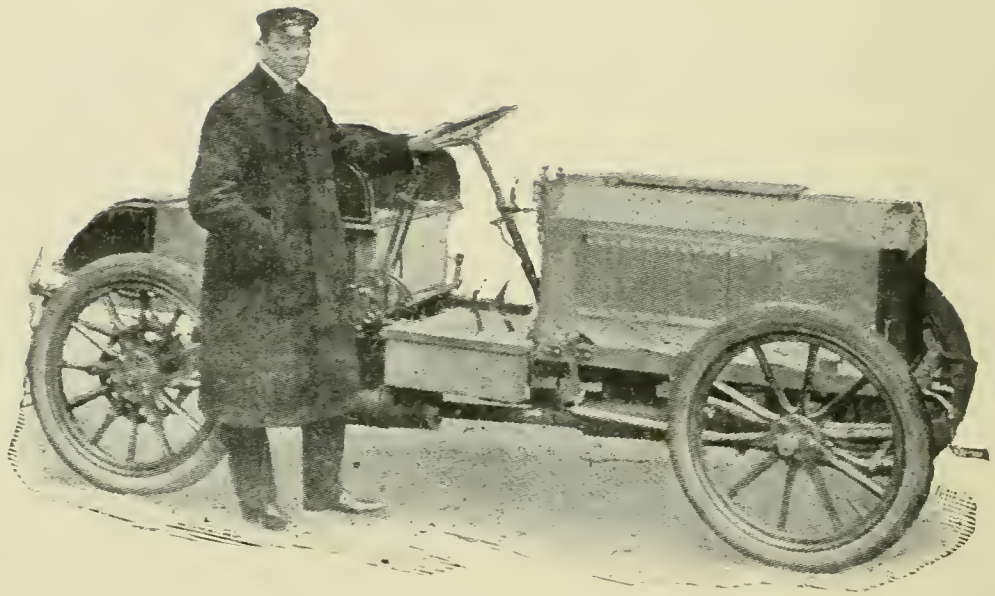


Napier 40 H. P. Cup Winner, 1902. F. S. Edge, Driver; M. S. Napier, Builder.

and a half in one hour. The second tricycle they built in the following year had the motor placed between the front wheels and Bouton made one kilometer a minute in a test with the vehicle. This was followed by a steam tractor that was entered in the Paris-Rouen contest in 1894. The steam tractor and another new vehicle were entered in the race from Paris to Bordeaux in 1895, and both machines made excellent time. In the Marseilles-Nice-Turbin race in 1897 the De Dion Bouton car came in, with flying colors, first.

Benz built a small three-wheel motor carriage fitted with a gas engine in 1885. The engine was placed behind the seat. The crank shaft was arranged vertically so that the fly wheel revolved in a horizontal plane. The engine cylinder was cooled by a water jacket. Benz built an improved vehicle the following year and in 1888 he constructed the light three-wheeled carriage illustrated above. He drove the machine fifteen miles an hour.

Butler was working on a tricycle motor in England about the same time that Daimler and Benz were at it in Germany. He was restricted by the road law which eventually disheartened him. Butler's tricycle had a rear wheel driven by a two-cylinder engine. The two front wheels were used for steering. When the carriage was first constructed he mounted the rear wheel directly on the



Mr. C. Jarrott and the new Napier Which He Drove in the Gordon-Bennett Race, 1903.

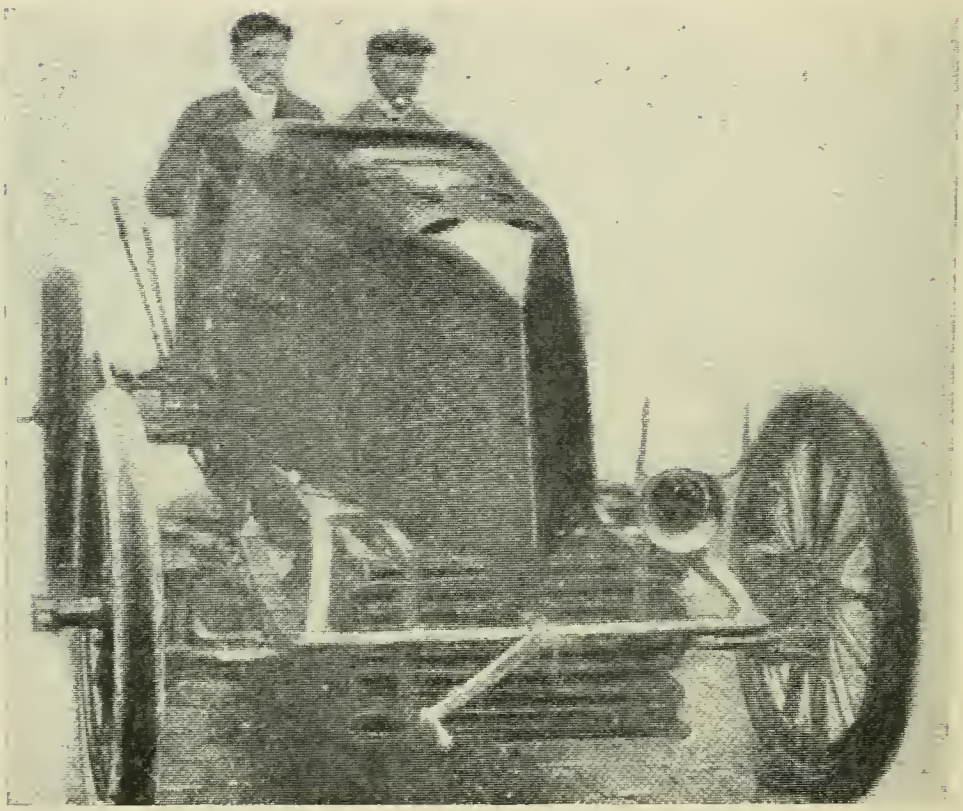
crank shaft with a crank on each side of it. The engine worked by air, carburetted by the spray of benzoline and the cylinders were cooled by water circulating through a radiating hood carried over the driving wheel to form a guard. The speed was controlled by a throttle valve and the machine was stopped by lifting the driving wheel off the ground by means of two small rollers forced downward by a pedal. The tricycle weighed about 280 pounds.

Panhard and Levassor were the first to make arrangements with Daimler for his motor engine and the firm commenced to manufacture engines for industrial purposes. They were wide-awake practical engineers and they constructed some engines for launches and later adapted their motors for road vehicles. In 1889 they began business and two years later a carriage was built on the style of a dogcart. The vehicle met with success at once and ten of the same style were built within a short time. The engines were only one and one-half-horse power and were geared to speed from six to ten miles an hour. The firm supplied Peugeot with eighty of their engines prior to 1894. The firm had built four styles of carriages during the second year of the business which were the small runabout, a brake to seat six, a wagonette to seat four, and a dogcart to seat four. Four Panhard & Levassor vehicles were entered in the

Napier Car With Five English Drivers—S. F. Edge, Mark Mayhew, C. S. Rolls, J. W. Stocks and Charles Jarrott.

Paris-Rouen run which was held in 1894. They were fitted with a V-type Daimler motor capable of giving off about 3-horse power. The ignition was effected by platinum tubes heated by lamps. The cylinders were cooled by water. The vehicles carried two tanks for fuel, one in front, which would hold fuel for a run of about fifty miles, and the tank in the rear of the vehicle held about enough for an additional run of seventy-five miles. The vehicles averaged about three gallons to the one hundred miles. It is noticeable that the wheels had wooden spokes and that the models at the show this year (1903) had in nearly all instances wooden wheels. The wheels last year were all constructed with steel wire spokes.

Passing down the stream of time from the source of the automobile to the outlet in the present sea of industry; from the crude little Newton car of 1680 which was propelled a little distance at a slow speed to the complicated magnificent creation of to-day which is self-propelled for over 100 miles at the speed of an arrow, one speculates naturally as to the future. Shall it be steam, the oldest motive power, electricity that subtle fluid which is doing such marvelous work under the direction of our scant knowledge of its possibilities, or the youngest offspring of the human brain, the motor of international combustion? The writer has ob-



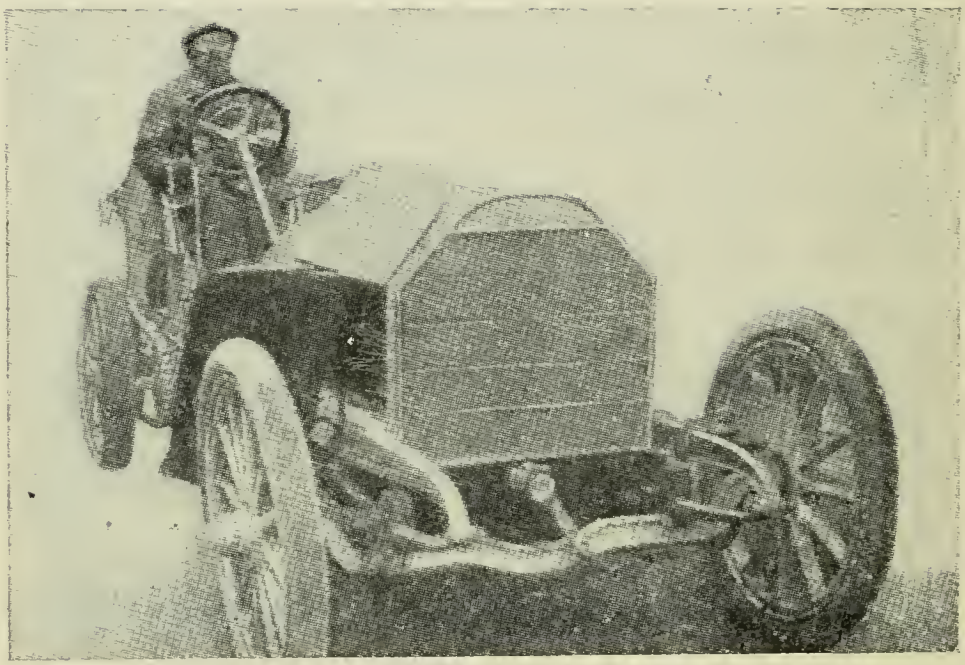
Mors—F. Gabriel, Winner Paris-Bordeaux, 1903, in the Paris-Madrid Race.

served the great possibilities of the three classes and he has hesitated to predict a lead for any, rather taking the views of practical men in the field, quoting them and leaving the choice to the reader.

For use in towns the electric car presents decided attractions. It is clean, free from smell and vibration, easy of control, and may be stopped and started at the will of the driver. The great drawback is the problem of the storage battery. The present device of batteries is not sufficiently durable and it is heavy. In the storage system the owner must always calculate on his distance from a charging station. The uncertainty of finding stations if a tour is contemplated makes this class of automobiles undesirable.

The steam car is silent and smooth in working. It is a simpler construction than the gasolene and possesses a great range of power and requires no experienced driver. It does, however, require from time to time replenishing of fuel and water. Much improvement has been made by a device for condensing the exhaust steam, but trouble is often caused by the oil carried from the cylinder with the steam. Some makers have overcome this defect. Long distance tests with many of the makes have proved satisfactory.

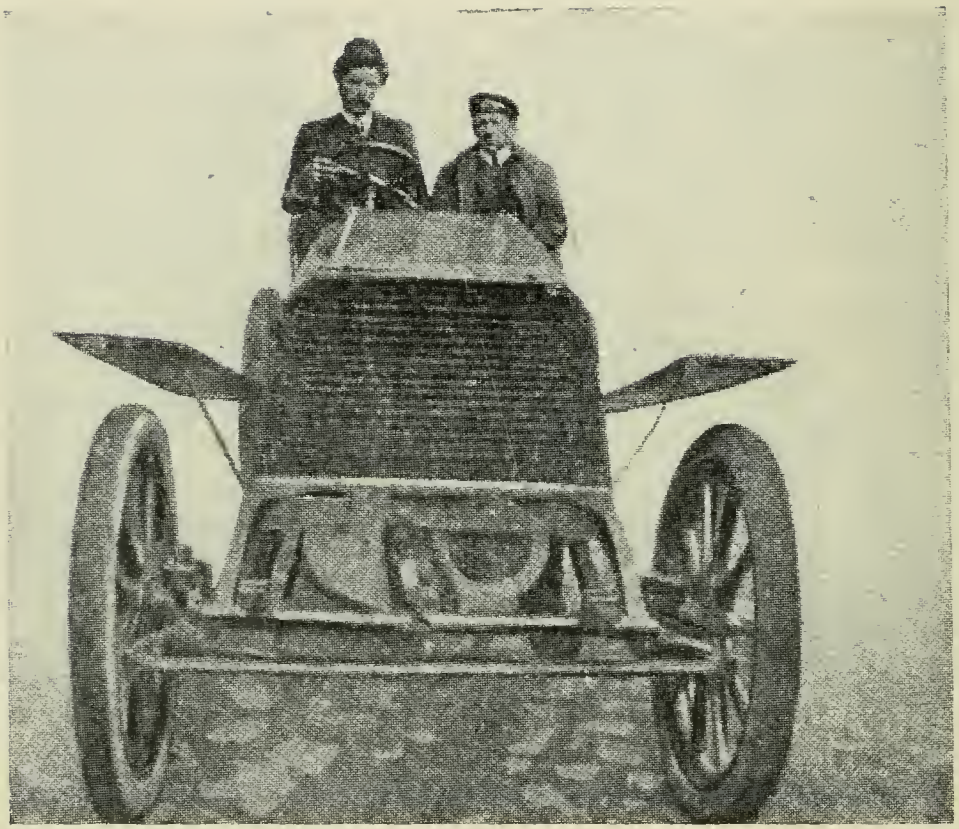
The popularity of the gasolene vehicle has come



Mercedes—Jenatzy, Winner Gordon-Bennett Cup, 1903

through its adaptability for touring long distances. The Gasolene automobile is constructed to carry sufficient fuel for a journey of one hundred or two hundred miles. The complication of its mechanism makes it a car easily got out of order. It is not adapted for frequent stops and starts as well as the other two classes. The engine must be started by giving the crank shaft a few turns by hand and when the car is standing the engine must be allowed to run, which causes a disagreeable noise and vibration. In the latest models the makers are overcoming this somewhat by more complicated working parts. A touring gasolene car requires a practical man to care for and drive it. The machinery requires variable-speed gearing to increase or diminish its power. The need of to-day is for a machine of simpler construction, less parts, to be placed more accessible for the drivers to get at in case some part requires attention. Improved methods of combustion and lubrication have overcome the offensive odors from machines of last year's make.

The gasolene machines made by the French and German houses have the reputation of being a superior make and the recognized center of the industry is France. She gained the leading place by the privileges afforded to drivers in sweeping over



Panhard et Levassor—Henri Farman.

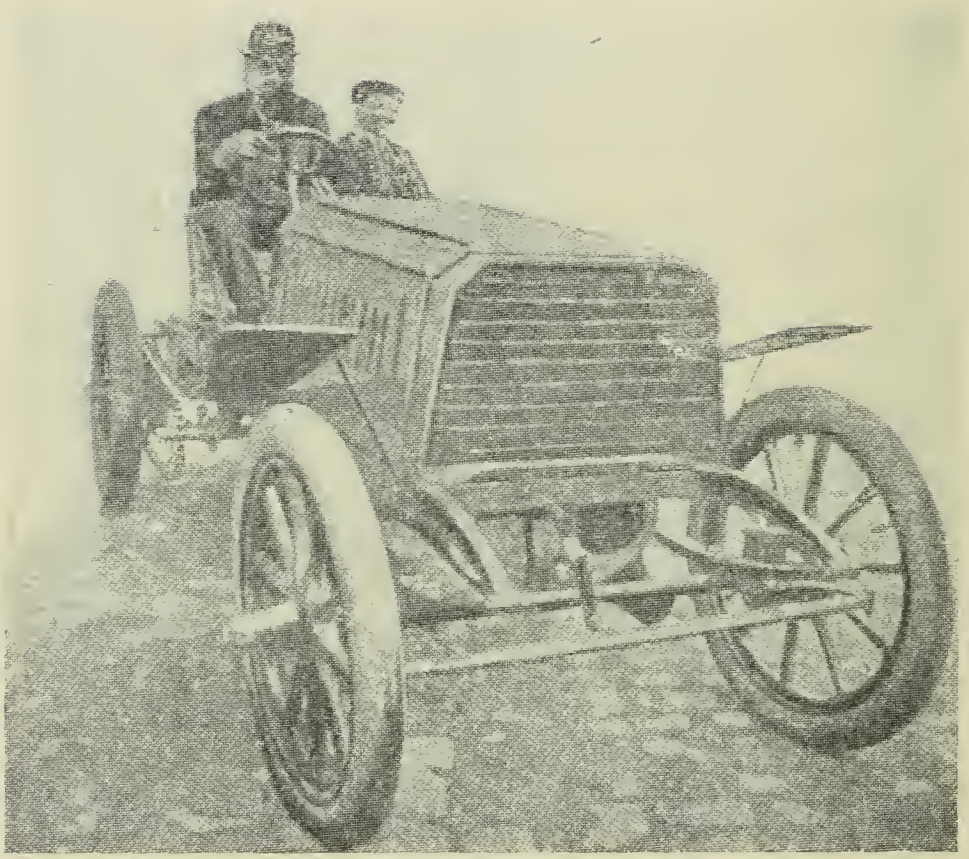
the highways in the '90s and the nation has held it up to the moment.

The Germans are realizing the importance of having a place for speed tests and there is a feeling among them that the International cup is going to cross the Rhine this year. The owner of an extensive estate in that country has notified the German club that he will allow his private highways in his estate for the use of a race in 1904. The advantages of the privileges afforded to English industries in automobiles by the late act of Parliament this year can hardly be estimated. It will be the means of giving the local industries a world-wide reputation.

America is sadly in need of a long distance course where the domestic make of machines can be put to the test and the uncertainty of endurance and reliability settled. The American car has the reputation in Europe for mile spurts over an even and smooth race course and the drivers here are thought not capable of driving a machine over a course of many miles at high speed. The American team will probably settle that question at the International race in July next.

Foreign Cars.

The success of automobiling in France aroused indifferent England after the contest held from Paris to Rouen in 1894 and a Panhard was intro-

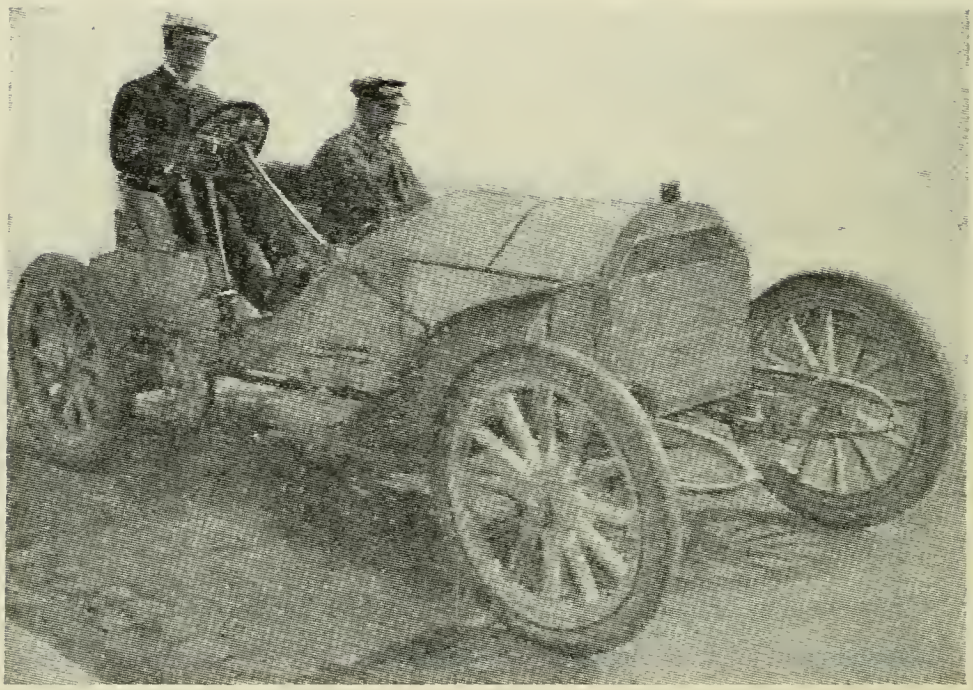


Panhard et Levassor—Rene De Knyff

duced into England in 1895; this was followed by a Peugeot machine and a De Dion steam car. When these cars were shown at an exhibition, agitation was started for a repeal of the old laws foisted on the country by the turnpike companies years ago. A bill was introduced in Parliament in 1895 to amend the law. It was passed November 14, 1896. The first contest in England was held under the management of the engineer in 1895.

The first automobile show held in England was at the Imperial Institute in 1896. Knight, of Farnham, claims the honor of building the first gasolene machine in England in 1895. It had a 1½-horse power engine. The carriage had two seats and was run on three wheels. The prominent makers in England about this time were the Daimler Company, organized in 1896; the Wolseley, the Napier, the Star and others soon followed.

Kennard, in speaking before the Great Britain and Ireland Automobile Club said: "This world is now entering upon the Mechanical Epoch. There is nothing in the future more sure than the great triumph which the epoch is to achieve. It has already advanced to some glorious conquests. What miracles of invention now crowd upon us. And yet, we have only begun; we are on the threshold of this epoch. What is it but the setting of the great distinctive seal upon the nineteenth century?



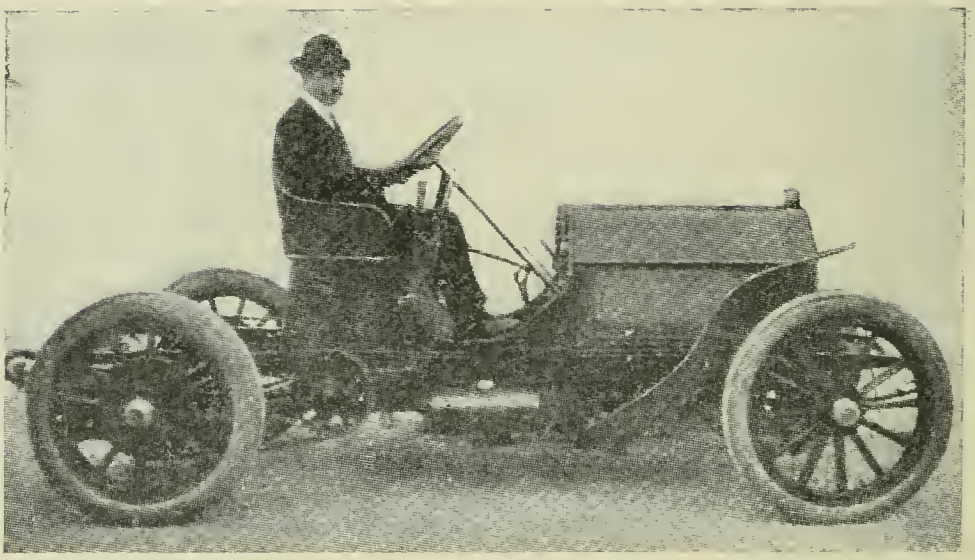
Mercedes—Baron De Caters.

An advertisement that society has risen to occupy a higher platform than ever before? Honor to be ever enbalmed in history, to be perpetuated in monuments, to be written in the hearts of this and succeeding generations."

American Vehicles.

Automobile construction was a little in the rear in the march of events in the United States. About sixty patents were issued up to 1899. The first one bearing the date of 1871 was issued to Charles Tellier for an ammonical engine. In 1880 C. H. Warrington invented a road engine and D. S. Troy received a patent for a velocipede. R. H. Long invented a portable steam engine in 1861. S. H. Roper constructed a successful steam velocipede in 1869 which was in use for twelve years; he then built a four wheeled carriagewith a coal grate to generate steam.

Dederick & Grass invented a steam man in 1868 and a lady who saw the unique construction wrote about it as follows: "About thirty years ago a genius Down East constructed a steam man in his own image and likeness, which could by means of burning coal in its vitals generate steam for its or his motive force, and walk out, superior to our race of puny mortals. The steam man was 10 or 12 feet in height and was indeed dreadful to behold. His great legs were the cranks or pistons, that when

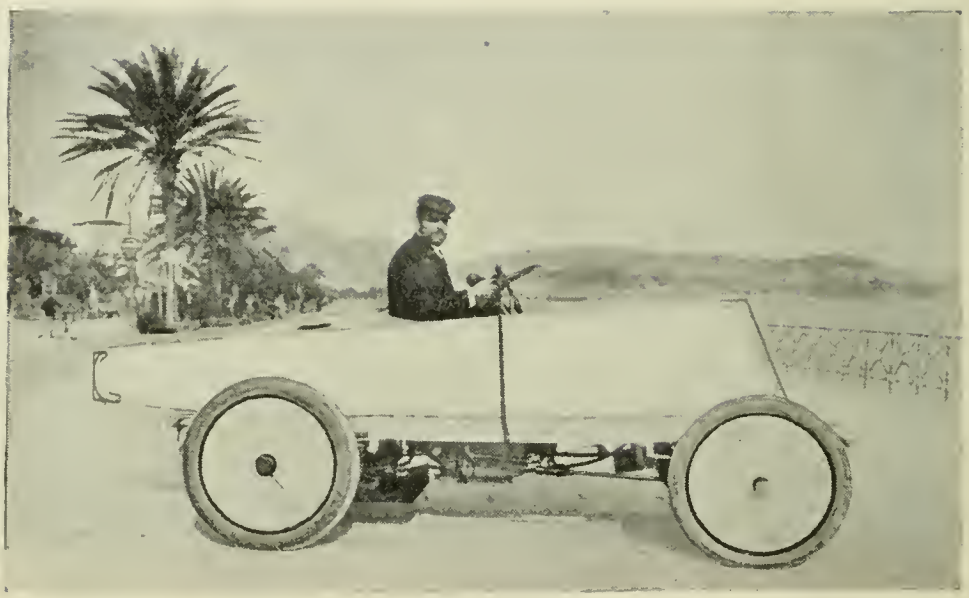


Mercedes—Foxhall Keene.

set in motion propelled the machine man. On his huge wood and iron head was an iron cap the exact fac simile of the auto head-gear of to-day. This also served as a smoke-pipe, and when this monster came clanking and pounding down the pike not only the domestic animals, but men, women and children fled to cover. Those who had hitherto held in their minds a doubt of the real existence of the foul fiend doubted no longer, for here they saw the propria persona, the King of all Hades, walking up and down the earth spouting fire and flame, seeking whom he might devour. Fortunately this Frankenstein was short lived and passed into oblivion, leaving no heirs to illustrate his momentary assumption of extraordinary human power."

In America a two-cylinder steam car was built by Fisher in 1853. He drove the car 15 miles an hour. Richard Dudgeon built a two-cylinder steam carriage which was destroyed at the Crystal Palace fire in this city in 1858. A steam fire engine, self-propelled, was built by Lee and Larned in 1863. F. Curtis, of Newburyport, Mass., built a steam runabout in 1867. On the Western prairies, J. A. Reed ran a steam wagon with much success in 1863.

This steam man recalls to mind a book written by Mrs. Loudon in England about 1865 on steam novelties. In it is related the trials of an aerial



Leon Serpollet in His Racer at Nice.

navigator who sailed over the great pyramid in Egypt. Observing an opening in the apex he descended and beheld the old ruler of the Nile land. The navigator revived him with an electric battery and his Royal Egyptian Highness escaped in the balloon leaving the aerial traveller a prisoner in the tomb. His royal "Nobs" sailed to London and proceeded to live in a manner befitting his dignity. Among his retinue was a steam valet which would perform its various duties by the pressure of different buttons on its form. The old king whose memory was poor would forget which button to press and when he was dressed for a reception, theatre or ball, he would approach the valet and press a button to get his clothes brushed; by mistake the button for the bath might be pushed and the result was a disagreeable surprise. The valet lost his position.

I. A. Sabbin invented a steam road wagon in 1870. In 1871 C. W. Hermance received patents for a road wagon; J. B. McKinley and F. Alger invented steam carriages, and L. G. Perreaux received a patent for a steam velocipede. W. R. Self invented a steam surrey in 1886. Copeland attached a 1½-horse power vertical boiler to a tandem tricycle and experimented with it in Philadelphia during the year of 1882. He used kerosene as fuel.

L. P. Mooers, Entrant for the Cup Race.

The New England light steam engines for motor vehicles attained a high degree of proficiency. They were constructed with a small sized ordinary engine fed from a tubular boiler heated by a gasolene stove. George E. Whitney, of Boston, built a light steam runabout and other successful manufacturers were the Butler Brothers, Dyer, of Boston; Dixon, of Lynn, and Porter, of Hartford. The Whitney carriage was introduced into England in 1884.

American Autos.

Attention to this new industry in America had not been confined to the Eastern States, for we find the Appersons were in partnership with Hayes and the firm began building automobiles at Kokomo, Indiana, in 1893, although it was five years later that the patent was granted. The firm claims that the first complete gasolene machine in the United States was built at their factory. Many firms started in building machines in 1895. The Chicago Times-Herald arranged for a contest in 1895, and one of the Duryea machines won the race. A Duryea car was in a demonstration which was held from London to Brighton in 1896. The affair was held in celebration of the new Light Locomotive Act which had become a law.

J. F. Duryea was one of the early inventors to take a patent out for this gasolene vehicle, which

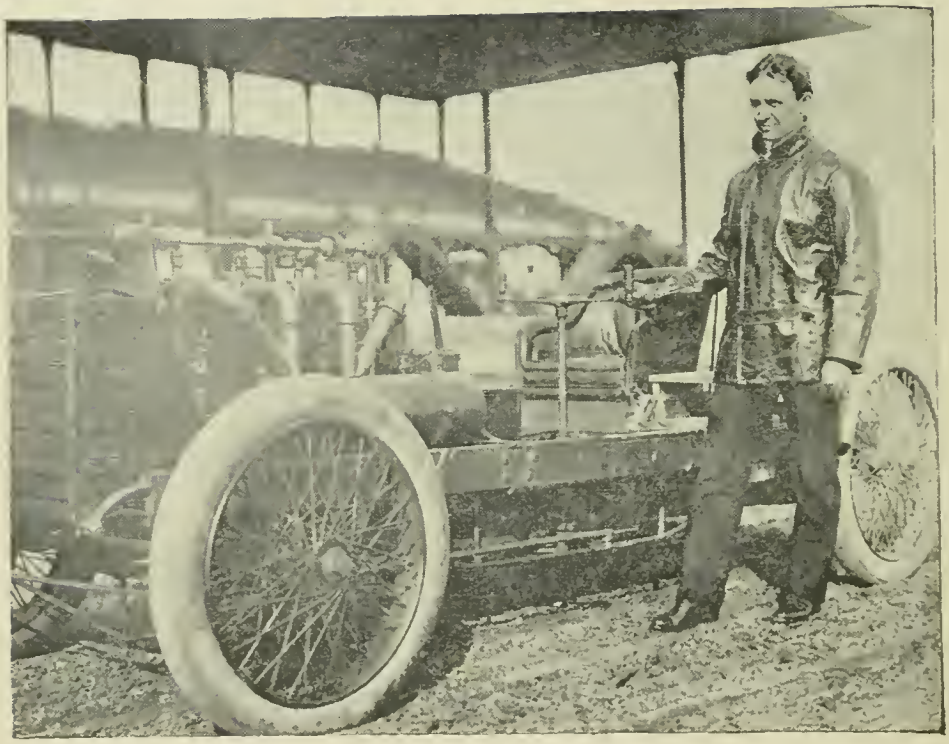
President Winthrop E. Scarritt, A. C. A., 1904.

was in 1896. His three-wheel runabout had achieved a merited success. It was the only carriage of that class at the automobile shows of 1903. C. E. and J. F. Duryea were making experiments in steam carriages before gasolene engines became popular. They had designed and constructed steam carriages for which patents were granted in 1897. The Duryea gasolene cars were first constructed in 1891.

Prominent pioneer machines in the United States were the Morris and Salom electric vehicles. Patents were granted H. G. Morris and P. G. Salom in 1895 for electric vehicles. The firm was afterwards organized into the Electric Vehicle Transportation Company and the patentees made a considerable sum of money from the transaction. Seven years before these patents were granted Daimler and Benz applied and secured patents for their gasolene vehicles in the United States. Daimler's patent was for an engine-driven vehicle and Benz protected his gasolene velocipede.

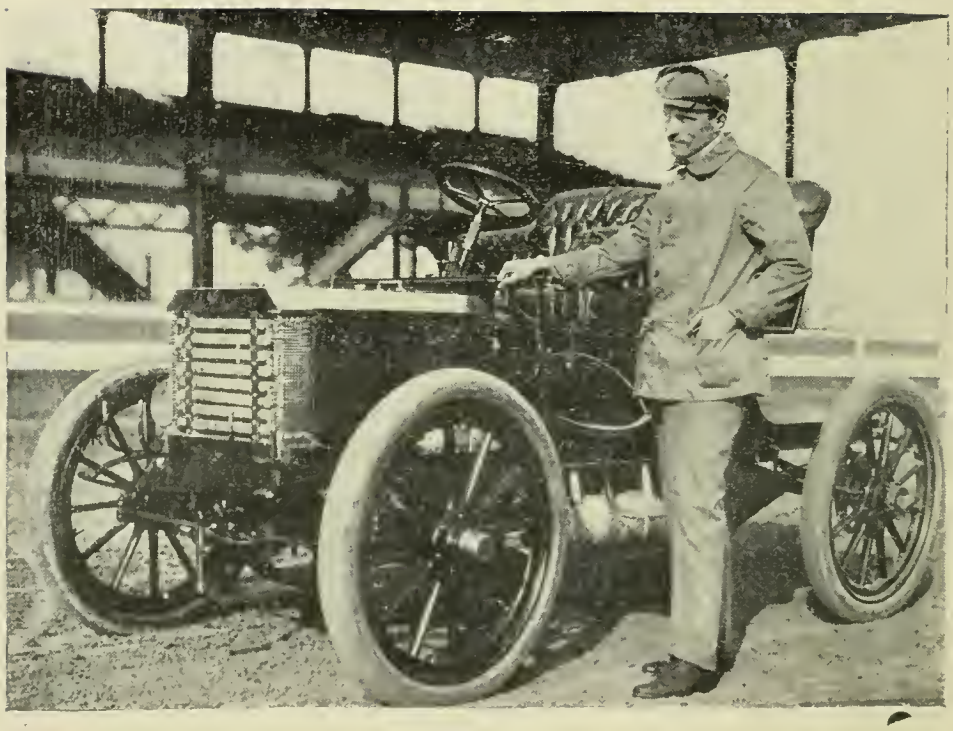
The American Weston steam runabout became popular on account of the ease to start it. A lighted match touched to the pilot burner started the burner under the boiler. The car had a water lift, by which the water was sucked up from any stream direct to the tank.

Another early company to be formed was the



Barney Oldfield and his Cooper Car, 999.

Mobile Company of America. It was started through the interest aroused by a contest of vehicles held under the management of the Cosmopolitan Magazine. Mr. Walker, the proprietor of the paper offered three thousand dollars for the best American automobile to be tested in a run from New York to Irvington-on-the-Hudson. The contest took place in 1896. The prize was awarded to a Duryea motor wagon. The American product was very imperfect at that time. Sixteen gasolene machines were entered. The carriages were crude; many started in the run, but few arrived at Irvington and only four were in condition to return to New York the same day. Mr. Walker was approached later by Messrs. Stanley of Newton, Mass., and Mr. Whitney of East Boston on the subject of entering into the manufacturing of steam automobiles. Their wagons were light in weight, scientifically strong and capable of high speed. Mr. Walker purchased the Stanley patents for $250,000, and sold one-half interest to A. L. Barber. Later Mr. Walker and Mr. Barber separated and the new company formed by Mr. Barber was called the Locomobile and Mr. Walker's company was known as the Mobile Company. Steam carriages are made by both of those companies. Mr. Barber bought the Whitney patents for a quarter of a million dollars and later divided one-half interest in them



Chas. G. Wridgeway, and His 80-H. P. Peerless Racer.
Paris-Madrid Contest.

with the Mobile Company. The history of the development of the Mobile has been written in gold. It has been stated that over $40,000 had been expended in perfecting the machines prior to the Pan-American Exposition.

The rapid stride of the gasolene vehicles bounding into universal favor soon put the steam and the electric classes in the shade. One of the leading patentees of gasolene machines was R. E. Olds, who received a patent for an automobile in 1897. Olds' little runabout, the dealers will inform you, is a good little machine to buy for practice and experience, "then throw it away and buy a high power machine." The automobile show held this year at the Madison Square Garden was like the opening of Pandora's box, it let out all the evils of imperfect mechanism on an unsuspecting public and many of the buyers are wiser if not sadder and this is but the beginning of a period when any self-sufficient alleged mechanic will assemble "automobiles," and will not be prevented from disposing of them to "the gentle customer," who will take his life in his hands every time he drives one of the gold brick machines.

Rubber Tires.

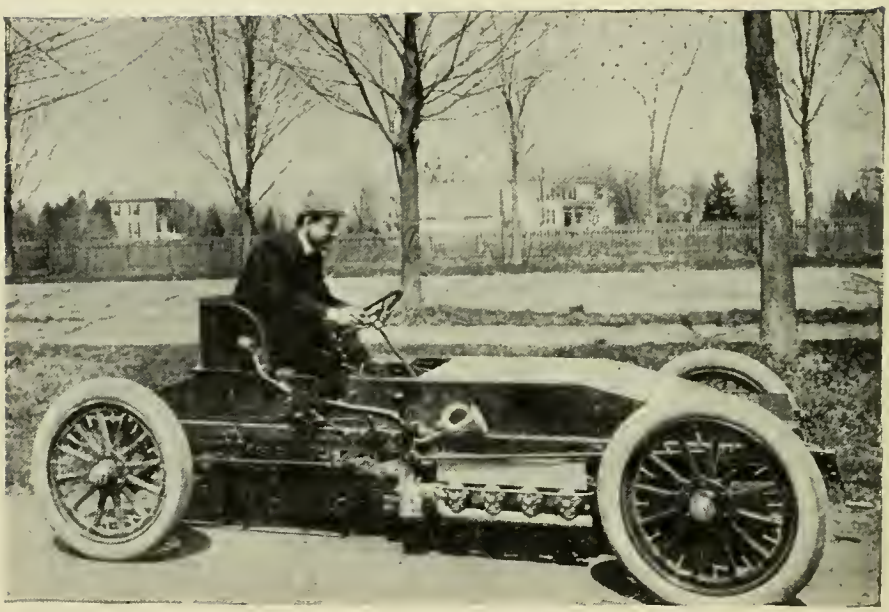
Rubber tires for wheels on steam vehicles were tested about twenty-five years ago. Ransom built a traction steamer in 1870 and constructed a de-

L. P. Mooers' Peerless Racing Car.

vice to overcome the jar on the machinery in his car. The tires were made of rubber in sections with linked shoes, which resulted in much satisfaction. Solid tires are proving to be more serviceable for heavy cars than pneumatic tubes. The electric cabs employed by the Electric Transportation Company in this city abandoned the air tires for solid rubber. The expense of repairs on the pneumatic tires would have compelled the company to close down the business. Solid rubber tires on heavy vehicles give better results in wear and at considerably less cost.

Rubber tires are necessary for the wheels. They overcome and prevent much of the jar on the machinery while the car is speeding over the ground. The automobile of to-day is the result of many years of untiring energy and study by persevering and brainy men of the past two centuries. Gradually, bit by bit, its perfection was attained and when the new system of combustion was discover ed the mechanics were ready to adopt it and proceed with its development.

The period from 1860 to 1880 was the transition period in the development of the modern wonderful construction, the automobile. The exactness of the measurement of each piece of machinery and the delicate yet powerful mechanism of the high grade cars are equal to the works of a Swiss watch. The



40-H. P. Winton Cup Challenger.

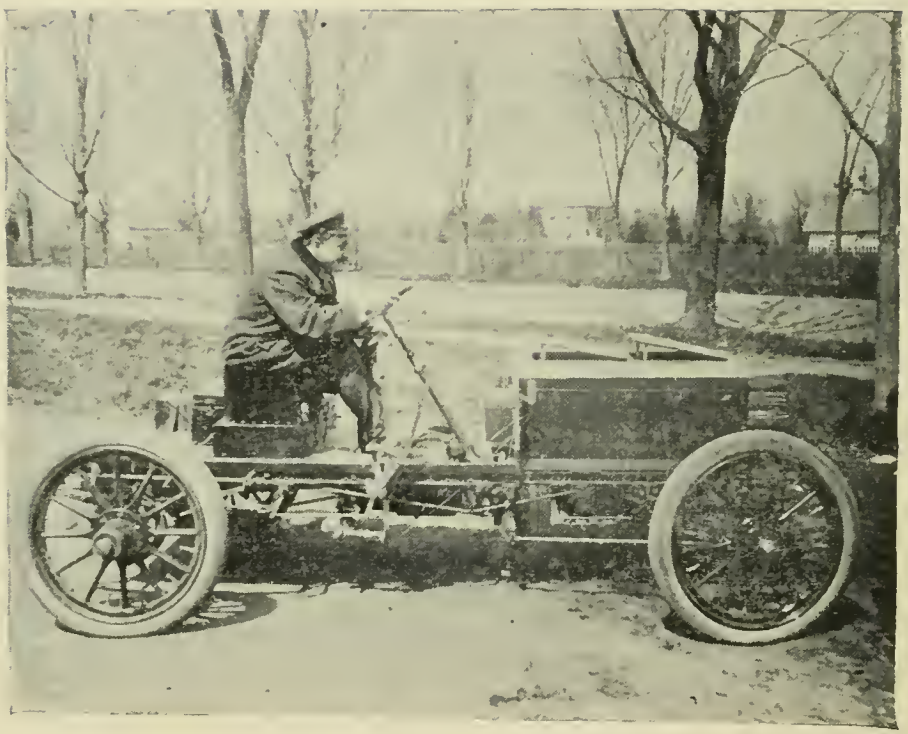
automobile is a sensitive thing and will not stand abuse.

Cost of Automobiles.

As regards the cost of cars, the American light runabouts are leading the world in results, at a minimum cost. A buckboard suitable for two with room for luggage was shown at the shows last winter for $350, and the price ranges from that up to $7,500 for a high power American machine; a magnificent car of the utmost comfort and speed much beyond the legal limitation in this country. The average price of a domestic car is $2,500. The lightweight machine built to carry four passengers safely and comfortably at from 20 to 30 miles an hour and at about half that speed on the country roads may be purchased for $1,500. Second-hand machines may be had for less.

Electric runabouts sell for $500 and $850; steam for $750; and gasolene for $1,000. The expense to run a machine a year varies, but it is estimated that the runabout will cost as much as keeping one horse and the touring car will cost about the same amount as a team.

The revival of self-propelled vehicles has grown to enormous proportions. The imports in Great Britain during the year of 1902 amounted to $5,512,310. The exports were valued at $657,405 About 40,000 vehicles are in use in England alone.



80-H. P. Peerless Cup Challenger.

France had 70 firms manufacturing automobiles last year. The output was 12,000 cars, which gave employment to 180,000 men, who averaged a yearly wages for labor of $360. The French exports amounted to $5,310,000. Four firms in that country last year sold tires which amounted in value to $4,100,000.

Pneumatic tires will wear for a thousand miles barring mishap and solid tires are more serviceable. The latter are used on all heavy trucks, lorries and electric vehicles, the former on touring cars and runabouts. If new devices in springs prove successful it may result in solid tires being used on all styles of vehicles. The King of England has adapted a combination on his cars. The front wheels are tired with pneumatic tires and the rear wheels have solid tires.

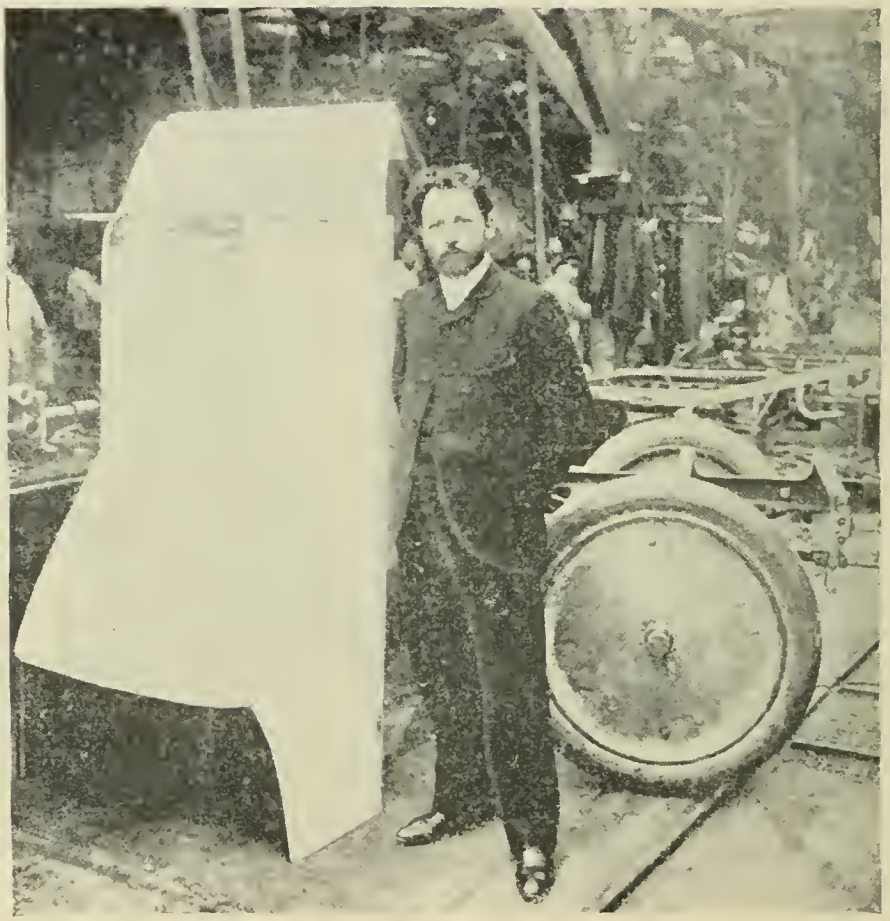
Racing Records.

From the cradle of civilization in the Indies when man first made record of events, competition was the method of development. To do a thing; to do it better, then to excel. No matter whether it was crushing corn with a stone; weaving flax for linens; or testing physical power. Competition or contest in any human endeavor brings out and develops an industry, art or sport, therefore SPORTS OF THE TIMES is in favor of contests of automobiles. The contests will help industry

J. Insley Blairs' 35-H. P. Panhard, Driven by Jos. Tracey at Auto Meet, July 25.

by the attention and advertising the business directly and indirectly will receive. The contests will afford interesting and pleasant sport. SPORTS is in hearty favor of speed contests on tracks or speedways, and on the highways for long distances. The more the merrier, and as fast as the machines can travel. It means the circulation of money. More people would learn something about the machines; more cars would be used, which means increased sales of vehicles; more business, and more work for the skilled mechanic. The automobiling industry should encourage races, and automobile fetes. Contests have brought aside from the pleasure of the affair, the greatest results to yachting and horse racing. Contests on the highways in France gave to that country the reputation of her far-famed machines. The names of English made machines were hardly known until Mr. Edge won a race with an English car called the Napier.

Interest in motoring had developed so widely in Paris that Le Petit Journal organized a competitive test for horseless vehicles in July, 1894. It was the first contest ever held of self-propelled carriages and 102 entries were made of the three classes, steam, gasolene and electric. The run was from Paris to Rouen, about 78 miles. When the time arrived only seven steam cars and fourteen



Leon Serpollet, Won the Flying Kilometer at Nice. Time, 29 1-5 seconds.

gasolene vehicles were on hand for the run. The gasolene cars all finished. Makers represented were Panhard-Levassor, Peugeot, Vacheron, Lebrun, Rogers, De Bourmont and Gautier. De Dion, Bouton, Le Blaut, Scotte and Archdeacon steam carriages received honors in the contest. A Tenting gasolene car was driven over the route later in seven hours

Paris was at the high notch of excitement over automobiling in 1895. Baron de Zuylen, Paul Meyan, Comte Recope, Comte de la Valette met at De Dion's house and organized the Automobile Club de France. About 150 men became members. An historic old house built in 1770 was taken on the Place de la Concorde, which has become the headquarters for automobiling in the world. Its membership in 1900 was over 2,000. Clubs in other countries gradually came into existence.

First Race.

The first contest of automobiles was held at Paris in 1894. It was not a speed test in any sense. The meet was arranged by the Petit Journal of Paris. The route was from Paris to Rouen, a distance of 79.4 miles. Like all races that followed, a large number of entries were made, but when the time arrived many machines were not forthcoming. In this test 102 entrants had signified intentions of competing.

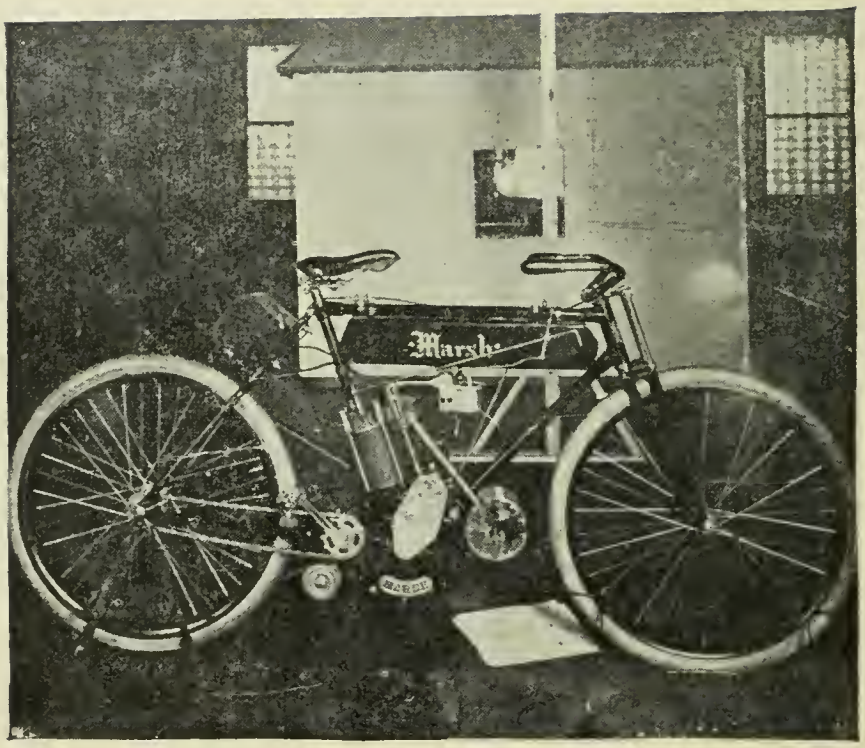
The meet was a landmark in the history of auto-

Count Zborowski, Killed at Le Turbie, April 1. He Won the Paris-Vienna Race, 1902.

mobiling. The number and class of cars entered were as follows: Thirty-eight steam, 29 electric, 5 compressed air, and 25 unclassed. When the day came for the meet only 21 cars actually entered. They were 14 gasolene and 7 steam motor. The run was made in an average time of 7½ hours. Prizes were awarded to Panhard-Levassor, Peugeot, Vacheron, Lebrun and Rogers. The De Dion-Bouton steam car averaged the distance at 12 miles an hour. A Panhard came in second in the race, Peugeot third, and a Panhard fourth. The results were flashed over the wires and all the world knew about the French machines.

Paris to Bordeaux.

The manufacturers and owners were so well pleased with the result that a big event was arranged to be held the following year, 1895, under the management of the Automobile Club de France. This meet was for speed. It was held from Paris to Bordeaux and return, a distance of about 735 miles. Levassor won the race in a Panhard-Levassor car, making the round trip in 48 hours, 48 minutes. His average time was 14.9 miles an hour. This speed was considered an epic event amongst the manufacturers at the time and a club dinner followed at the Paris Club. The general opinion was that about the maximum speed had been accomplished. Many foreigners in Paris at the time



Marsh Motor Cycle.

purchased machines. The sales were influenced by the race.

Auto Clubs.

It would be difficult to imagine what condition the automobiling industry would be to-day without the fostering care and assistance of automobile clubs. The organization of the French club was from the first a success and the first race from Versailles to Bordeaux and return was arranged by the club in July, 1895. The race created world-wide attention and automobile clubs in other countries sprang up like mushrooms. The Club pulled off another race on September 24, 1896, from Paris to Marseilles and return, a distance of 1,061 miles, and the question arose whether it was a safe plan to make it a continuous race. Many of the members objected to the idea of the entrants driving a car all night long at a high speed. They declared it was extremely dangerous and the racing committee finally decided to divide the distance in stations and thus allow the drivers to remain over night in some town and continue on the following day. The route was covered by the racing cars in three days, and a Panhard car completed the distance in 67 hours, 42 minutes and 58 seconds. The following year a test trial of heavy weight vehicles was held by the club. Belgium fell into line and a club was organized at Brussels

A. Champion—4 Cylinder Motor Cycle, World's Record.

on May 7, 1896, the membership list of which contained the names of the foremost men in the country. The King added his presence and became the honorable head. The club is called the Automobile Club de Belgique. A vehicle finished with a graceful curve to the tonneau back was designed by the King and is known to-day as the King of the Belgium style.

Another season passed before the English organized a club. The celebration held by a run of vehicles from London to Brighton on November 14, 1896, in honor of the amended Light Locomotive Act precipitated the movement and on August 10, 1897, the Automobile Club of Great Britain and Ireland was organized, which started with 163 members. The first great event held in England was an endurance run of 1,000 miles from London on a western route to Edinburgh and return through the eastern part of the island to London. The members became very earnest in their endeavor to boom the industry. Week-end runs, club dinners, lectures, and discussions soon made the club popular, and its influence was felt throughout the land. Clubs were formed in nearly every city in the United Kingdom. The Automobile Club Bordelais was started in May, 1897, and then Nice organized the Auto Velo Club the same year, as did Dordogne. The Nice Club went in for gayety

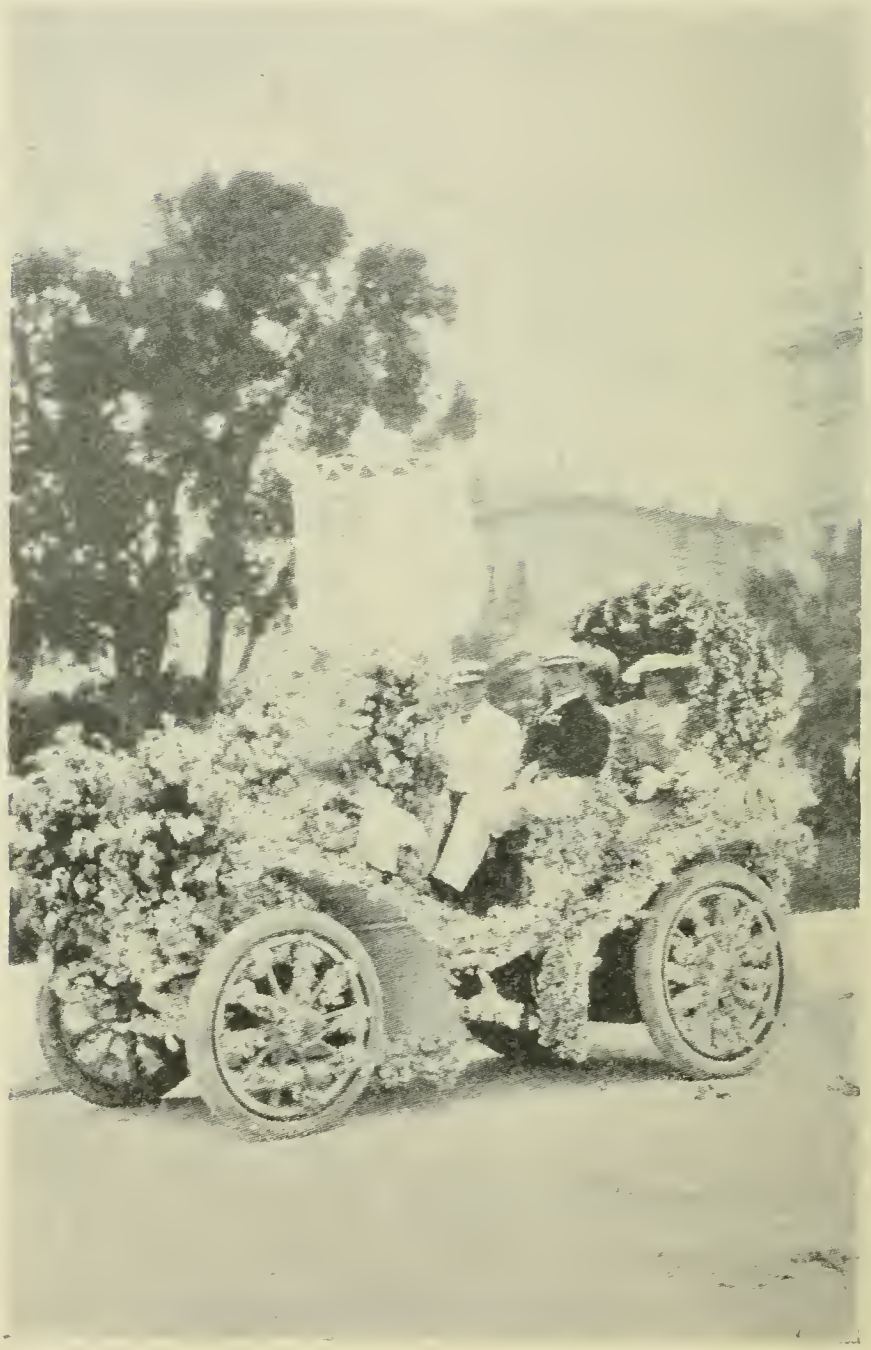
Mr. Schwab in His Mors Touring Car.

and it has set the pace for a gala week in the city every spring. Automobiles decorated with flowers are driven in a procession through the main thoroughfares and speed and grade tests form part of the program. It was during the gala week this spring in the grade tests that Count Zborowski met with a fatal accident.

The Veeloce Club e Club Automobilisti d'Italia was organized at Milan in 1897. The next year three clubs came into existence, one in Switzerland, one in Austria and one in the Netherlands: the Automobile Club de Suisse, December, 1898, at Geneva; the Oesterreichischer Automobile Club, February 6, 1898, at Vienna; and Nederlandsche Automobile Club, at Driebergen. It was not until the year of 1899 that the American and German clubs were formed. The Deutscher Automobile Club was formed July 31, 1899, at Berlin.

Chicago Contests.

The Times-Herald, of Chicago, arranged for a contest to be held at Chicago in 1895. A prize of $500 was offered. Only a few cars entered the contest which was won by a Mueller car. Duryea, Benz and Rogers machines were entered. A Benz motor cycle finished in the contest. How much this contest helped to boom the industry has never been told.



Prize Winner at Nice Floral Fete.

The Automobile Club de France called a race contest in 1896. It was over a course from Paris to Marseilles, a distance of about 1,068 miles. The course was divided into three sections and was covered in the remarkable time of 64.42 hours, by Mayade in an 8-horse power Panhard, and averaged the distance at a rate of 16.52 miles an hour.

The first contest in New York was arranged by the owner of the Cosmopolitan magazine. Mr. Walker, the proprietor of the paper offered $3,000 for the best American automobile to be tested in a run from New York to Irvington-on-Hudson. The contest took place in 1896. The prize was awarded to a Duryea motor wagon. The American product was very imperfect at that time. Sixteen gasolene machines were entered. The carriages were crude; many started in the run, but few arrived at Irvington and only four were in condition to return to New York the same day.

The Marquis de Chesseloup-Laubet won the race of 1897, from Marseilles to Nice, a distance of 144½ miles, in a De Dion steam car. The machine weighed three tons and it went over the course in 7 hours, 45 minutes, at an average time of 18 miles an hour. A Peugeot machine was the second to finish in the race.

On July 24, 1897, a run was arranged by the French Club from Paris to Dieppe and Trouville, a

Baron De Zuylen's Airship Car, Nice.

distance of 106 miles. A Panhard won the race in 4 hours, 36 minutes; 69 machines started and 55 finished the course.

Charron, in an 8-horse power Panhard, won the race which was held from Paris to Amsterdam, a distance of 933 miles in 1898. He drove over the course in 33.04 hours, at an average speed of 28.21 miles an hour. This was a gain of nearly 100 per cent. on the average speed per mile in the third annual contest held in France.

Tour de France.

The Grand Tour de France was arranged by the Automobile Club in 1899. The distance of the run was 1,429 miles, and Rene de Knyff, driving a 16-horse power Panhard, cut the time of hourly average to 33.58 miles. He drove over the course in 42 hours, 33 minutes.

The race from Paris to Toulouse and return was held in 1900. It was a course of 837 miles and Levegh increased the speed and reduced the time. He drove a 28-horse power Mors over the route in 20 hours, 50 minutes, at an average of 40.21 miles an hour.

Gordon-Bennett Cup.

The first Gordon-Bennett cup race was run from Paris to Lyons, 353¾ miles, in 1900. France had it all her own way. Charron won in 9 hours, 9 minutes, on a Panhard. Girardot was the only other

H. C. Cryder Drives a Moyea to Lakewood.

rider to finish. De Knyff broke his fourth speed; Winton and Jenatzy (Belgium), did not finish.

The Automobile Club of France is the guardian of a cup donated by Gordon-Bennett, which is intended as an international challenge trophy. Every foreign club recognized by the French club is entitled to make a challenge to the winner of the cup. Notice of the challenge must be sent on January 1 in each year, and the sum of 3,000 francs must be deposited for forfeit of non-appearance at the contest. Each challenging club may be represented by one, two or three vehicles. Only three vehicles can be entered from any one country. The contest must be held every year between the 15th day of May and the 15th day of August. The date is to be mutually agreed upon before the 1st day of February. The racing machines shall weigh at least 400 kilos and not exceed 1,000 kilos, and shall carry at least two passengers whose average weight shall be 60 kilos.

The cars and machines in each and every part shall be entirely constructed in the country of the clubs which they represent, and shall be driven by members of the competing clubs. Each club shall nominate a delegate. Gordon-Bennett shall always be an ex-officio member of this commission. The Automobile Club de France shall also be represented in the commission. The race shall be held on a

Automobile Club of America, Reception Room.

road not less than 550 kilos and not more than 650 kilos. The holding club shall choose the route. The race shall be run in the country where the cup is held or in France. The cars shall start at intervals of two minutes. A car of the holding club shall start first. The contest is go-as-you-please and the one which shall cover the distance in the shortest time shall be declared the winner. The winning club shall only be the holder, not the owner of the cup. Like the yacht cup, it shall revert to Gordon-Bennett if the holding clubs cease to exist. The expenses of the organization of the race itself shall be disbursed by the holding club and after the race it shall be equally divided by all clubs in the race.

In the Gordon-Bennett cup race of 1900 the only competitor from the United States was Alexander Winton, of the Automobile club of America, who, through an accident to his car failed to complete the course. Charles Gray Dinsmore was the delegate of the Automobile Club of America, and John H. Flagler was vice-delegate.

In the Grand Prix de Pau held in 1901, Maurice Farman won the race, driving a Panhard a distance of 205 miles in 4 hours, 28 minutes, 20 seconds, an average of 46 miles an hour.

The Gordon-Bennett and the Paris-Bordeaux races were run on the same day, May 29, 1901.

Automobile Club of America, Dutch Kitchen.

Girardot won the cup in a 40-horse power Panhard in 8 hours, 50 minutes, 59 seconds, averaging 37 miles an hour; no one else finished. The Automobile Club of America had no entrants in the race. The race ended disastrously. Charron and Levegh collided and Girardot had a walk-over.

Baron de Rothschild won the non-control race with a 35 horse power Mercedes, Nice to Toulon and return, a distance of 244 miles, in 6 hours, 45 minutes, 48 seconds.

Paris-Bordeaux.

Henri Fournier made his first record in a 60-horse power Mors at the Paris-Bordeaux race, May 29, 1901. The distance was 348 miles, which he covered in 6 hours, 10 minutes, 44 seconds, or at an average speed of 56.48 miles an hour. In the three-day contest from Paris to Berlin the same year, he drove 745 miles in 16 hours, 6 minutes, at an average speed of 43.66 miles an hour. Three hundred entrants paid an entrance fee, but only 109 machines started. All the noted French chauffeurs were in the race, Fournier, Charron, Girardot, De Knyff and Farman. Edge, the noted English driver was entered and Foxhall Keene an American; both were unfortunate in crossing culverts. Their machines were rendered useless in the race.

The entrants were divided into four classes. 1st —machines weighing over 1,450 pounds, 41 entries.

Medal Awarded by Automobile Club of America,
New York-Boston-New York Endurance Run, 1902.

two men were to ride in the car and their weight was required to be 310 pounds; 2nd—cars weighing over 880 and less than 1,450 pounds, 47 entries; 3rd—voiturettes weighing over 550 pounds and less than 880, 10 entries; and motor cycles weighing under 550 pounds, 11 entries.

Madame Dugast, a noted automobilist made the run in 27 hours. At the first station, Aix-la-Chapelle, 77 entrants arrived, having driven a distance of 285 miles; the second station was Hanover, 278 miles, 62 entrants arrived there; and the last stretch of 185 miles to Berlin found only 45 to arrive. Two women entered the Paris-Madrid contest which was held in 1903. Fournier made the route in 16 hours, 6 minutes; Girardot in 17 hours, 1 minute; and De Knyff in 17 hours, 4 minutes. Fournier received the prizes given by the Emperor of Germany, King of the Belgiums, Grand Duke of Luxembourg, and the city of Hanover. In the class for light cars, Grand made the route in 19 hours, 33 minutes; Louis Renault in 19 hours, 16 minutes, 25 seconds; and Osmort, motor cycle, 18 hours, 59 minutes, 50 seconds.

In 1902 the Automobile Club of France held a race from Paris to Vienna, a distance of 726 miles. The late Count Zborowski was the first to arrive. A 26-horse power Renault was driven by Farman over the course in 12 hours, 6 minutes, 12 3-5 sec-

Reverse Side of Automobile Club of America Medal.

onds. The machine was purchased after the race by W. K. Vanderbilt, Jr. Marcel Renault was declared the winner in a light Renault car. Time, 15 hours, 38 minutes, 32 2-5 seconds.

June 26, 1902, the Gordon-Bennett cup was contested for the third time. A Wolseley and a Napier car were entered by the Automobile Club of Great Britain and Ireland, but the Wolseley car was withdrawn at the last moment and S. F. Edge with a Napier was the only English contestant. Girardot, the cup holder, started, followed by Fournier, Edge and De Knyff. The course was in two sections, Paris to Belfort and Bregenz-Innsbruck, a combined distance of 385 miles. Edge drove in a 40-horse power Napier over the route in 10 hours, 42 seconds. The Automobile Club of America was not represented.

On Saturday morning, April 26th 1902, the Long Island Automobile Club held an endurance test of 100 miles on the Jamaica highway on Long Island. Many of the starters were disqualified for violating rules under which the competition was held. A remarkable speed test of 105 miles was covered in 2 hours and 24 minutes. The machine that made this flying trip was a 24-horse power Panhard, which was owned by J. E. Ewing. It was the fastest time for that distance ever made in this country. Part of the distance was made at the rate of

Portable Asbestos Automobile House.

a mile in 56 seconds. Mr. Ewing was accompanied by Chauffeurs Voight and Hill. In the century endurance test 67 started; the first car entered at 9.30 a. m., and the others started at intervals of 30 seconds. The distance was to be covered in 400 minutes. The first nine cars to cover the course were disqualified. The contestants competing in the course were as follows: International Motor Car Company, steam, 6 hours, 14 minutes; A. H. Funke, gas motor, 6 hours, 20 minutes; Ward Leonard Electric Company, gasolene, 6 hours, 22 minutes; George M. Brown, gasolene, 6 hours, 22 minutes; The W. W. W. Company, gasolene, 6 hours, 32 minutes Percy Owen, gasolene, 6 hours, 35 minutes; Ohio Automobile Company, Gasolene, 6 hours, 37 minutes; C. Owen, gasolene, 6 hours, 38 minutes; Peerless Manufacturing Company, gasolene, 6 hours, 39 minutes; Ward Leonard Electric Company, gasolene, 6 hours, 40 minutes; White Sewing Machine Company, steam, 6 hours, 41 minutes; White Sewing Machine Company, steam, 6 hours, 41 minutes; J. Insley Blair, gasolene, 6 hours, 44 minutes; E. E. Britton, gasolene, 6 hours, 46 minutes; Ohio Automobile Company, gasolene, 6 hours, 50 minutes; Paterson & Shaw, gasolene, 6 hours, 52 minutes; Michael Piel, gasolene, 6 hours, 56 minutes; Ward Leonard Electric Company, gasolene, 6 hours, 58

Steam Motor Fire Engine "Jumbo," Hartford, Conn., Fire Department.

minutes; Oldsmobile Company, gasolene, 6 hours, 58 minutes; H. S. Chapin gasolene, 7 hours, 1 minute; H. M. Wells, steam, 7 hours, 4 minutes; William Van Wagoner, steam, 7 hours, 6 minutes; Locomobile Company of America, steam, 7 hours, 7 minutes; Torbensen Gear, gasolene, 7 hours, 6 minutes; Percy P. Pierce, gasolene, 7 hours, 8 minutes; A. G. Southworth, steam, 7 hours, 10 minutes.

A speed contest of one mile distance was held at the Ocean Parkway on Coney Island, November 16, 1901. A. L. Riker drove an electric vehicle of 15-horse power one mile in 1 minute and 3 seconds. Fournier was present at the contest and made a mile record in a 40-horse Mors machine in 52 seconds. The second test was made in 51 4-5 seconds. Foxhall Keene drove a Mors machine of the same power one mile in 54 3-5 seconds. A. C. Bostwick drove a Winton car one mile in 56 2-5 seconds, and upon the second trial, 60 3-5 seconds.

The world's record of one mile distance is as follows: Augieres, Mors gasolene car, 0.46 seconds, Paris, November 16, 1902; S. T. Davis, Locomobile steam car, 1.12, Staten Island, May 31, 1902; A. L. Riker, Riker Electric car, 1.03, Brooklyn, November 16, 1901.

The world's record for one kilometer (.621 of a mile) is as follows: Henri Fournier, Mors, 29 seconds, Paris, 1902; Leon Serpollet, Serpollet

16-H. P. Panhard, Owned by **E. E. Britton.**

steam car, 0.29 1-5, seconds, Nice; W. C. Baker, Baker Electric, 0.36 1-5 seconds, Staten Island, May 31, 1902.

The Automobile Club de France has made a special feature each year of a long run from Paris to some city in the neighboring countries. The greatest contest ever arranged was scheduled for that fatal day, May 21, 1903. A tourist party preceded the race which was to make easy stages and arrive at Madrid on the same day as the racers.

When the tourist party of the Paris-Madrid race left Paris on May 13 to arrive at the Spanish capital on Tuesday, May 23, the members of the party were to meet the racers who were to cover the course in three days. Fate had decreed that the race should not be finished. At the first rays of light at 3.30 o'clock Sunday morning, May 24, the racing machines, 216 in number, of many classes and manufacture, left Versailles, a suburb of Paris, at intervals of one minute each to race to Madrid, a distance on the highway of 821½ miles.

The entrants to the race left in order of the numbers they drew for places. No qualification was necessary for the drivers and the machines went spinning over the road leaving a cloud of dust as dense as a heavy fog. Louis Renault was the first driver to arrive at Bordeaux, the first stopping

A Searchmont in Fairmount Park, Philadelphia.

place, a distance of 342¾ miles. Gastand, in a 60-horse power Mercedes, arrived at 2:33:16 in the afternoon. Then the shocking reports of accidents on the route were flashed over the wires and we learned that six persons were killed and thirteen were more or less injured.

When the accidents became known officially to the French and Spanish governments, they forbade the race, and it was discontinued. The consensus of opinion among the expert automobilists is a sincere regret for the fatalities and the victims. The race was less of a contest of sportsmanship than a competition between rival manufacturers seeking to gain a reputation.

According to the Echo de Paris the following were the times at the end of the first stage, 343 miles: Gabriel, in a large Mors car, 5 hours 13 minutes 31 1-5 seconds; Louis Renault, in a light Renault car 5 hours 22 minutes 59 seconds; Salleron, in a large Mors, 5 hours 46 minutes 1 4-5 seconds; Jarrott, in a large Dietrich, 5 hours 51 minutes and 55 seconds; Warden, in a large Mercedes, 5 hours 56 minutes 30 4-5 seconds; Rougier, in a Turcat-Mery; 6 hours 16 minutes 7 4-5 seconds; Mouter, in a De Dietrich; 6 hours 17 minutes 54 1-5 seconds. These were followed by Baron de Crawhey, in a Panhard Levassor, 6 hours 1 minute 8 2-5 seconds; M. M. Voight, Charron Girardot &

Grout Steam Runabout.

Voigt, 6 hours 1 minute 9 1-5 seconds; Gastand, M. A. Fournier, Barras, in a Darracq, 6 hours 12 minutes 49 1-5 seconds; Berteaux, Henry Braun, Chanliaud, Teste, Peellison, Masson, Lavergne, Thevy and Decaters.

M. Gabriel, the winner of the race as far as Bordeaux, vigorously condemned the reckless imprudence of the spectators along the route, and the lack of official precautions to restrain them. He says the further he got from Paris the less able the populace seemed to conceive the danger and gauge the speeds of the cars.

When they were warned by experienced persons that the approaching machines were speeding like express trains they laughed incredulously and only dashed aside in terror as the vehicles rushed past. In many localities half a dozen gendarmes and a dozen soldiers were entrusted with the task of keeping two or three thousand spectators off the route.

The greatest speed attained was $88\frac{3}{4}$ miles an hour by Louis Renault and the highest average speed for full stage was made by Gabriel, 66 miles an hour. Marcel Renault was fatally injured by the overturning of his car in a ditch near Coube-Verac. He tried to avoid running in a railroad crossing gate and steered into a tree. Mr. Portor and Chauffeur Nixon collided with a railroad

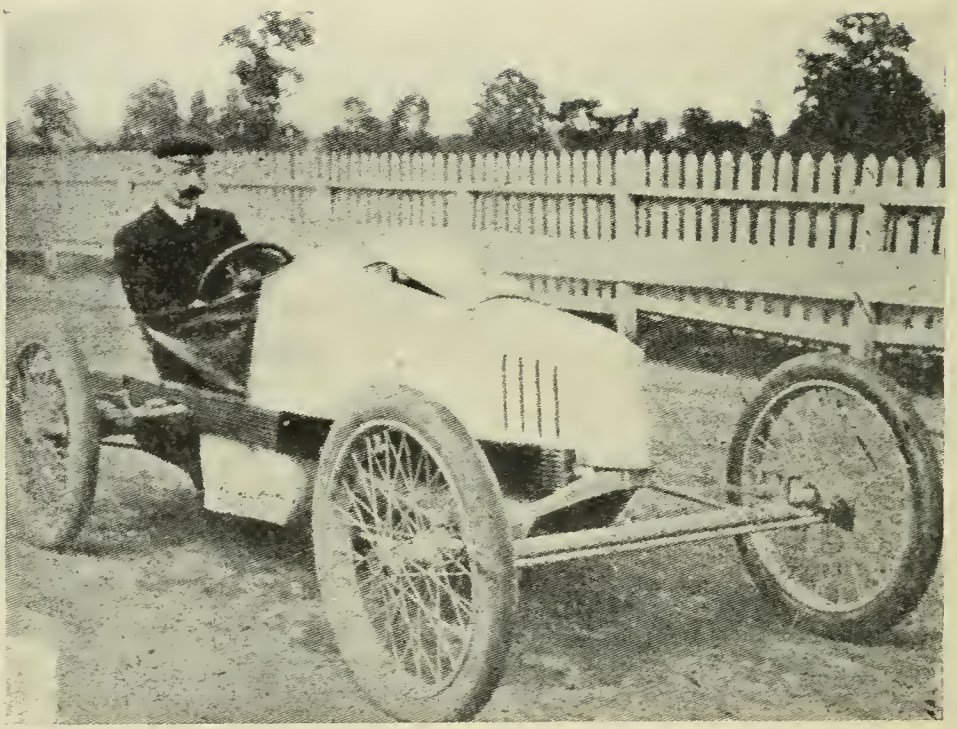
Orient Car, Boston Show.

guard's shanty, the car overturned and Nixon was caught under the car which took fire from escaping gasolene. Nixon was incinerated. Portor was very badly burned.

Barrow tried to avoid a dog on the road and his car struck a tree; his chauffeur, Pierre, was instantly killed and Barrow was severely injured. Near Angouleme Tourand's machine ran into a tree and in overturning fell on two soldiers and a child, killing all three.

Mr. Foxhall Keene said: "The killing or maiming of so many persons is a terrible blow to both individuals and automobiling. M. Marcel Renault and Mr Barrow were both of the highest class of drivers and good sportsmen. The effect will be a serious if not an irreparable blow to fast automobiling. I had hoped to drive my 60-horse power car. It was a wonderful machine, showing 112 kilometers without effort, but at the last moment we were unable to complete the necessary repairs."

The Liberte of Paris is of the opinion that the Paris-Madrid race proved once for all that public roads are not proper places for automobile racing. It adds: "But we cannot refrain from expressing our sincere admiration for the courageous men who face in such numbers such terrible dangers. It is a comforting spectacle to see so much energy displayed in the pursuit of glory of this slight



Packard Gray Wolf, 1904 Racing Car.

nature; so much intelligence devoted to the conquest of locomotion. France is still at the head of civilized nations in this feverish struggle. She has by her great inventions contributed most to transform modern life These inventions are automobiles, steering balloons and sub-marine navigation."

Henri Fournier said at the time: "I had a fair start in spite of the immense crowd of spectators that lined up the Avenue St. Cyr at Versailles. The few battalions of soldiers that were posted along the road partially succeeded in clearing a passage, but eight miles from Versailles the danger from silly spectators, who pushed each other forward from the roadside, became greater.

"I continued, under great difficulties for sixteen miles further when a sudden jolt occasioned by blocks of pavement into which I ran in trying to avoid killing a group of spectators, knocked my oil box into pieces. In spite of this I continued, expecting to replace it at the first stop. I, however had another accident before arriving at Chartres.

"My magneto broke and the car came to a standstill. To repair it on the road was impossible and I was obliged to surrender all hopes of continuing the race.

"Considering the frightful number of accidents

Robinson Touring Car, Boston Show.

I don't regret that my race came to a quick conclusion."

The club committee received much censure for not providing better patrol of the highway. Mr. W. K. Vanderbilt Jr. said: "I found it impossible to continue the race, considering the state of the road. On starting from Versailles, where I arrived at the last minute, I could scarcely make my way through the immense crowd. The starting point itself was so encumbered that it looked as if I could advance only by running over the dozens of journalists who actually stood close enough to my automobile to touch it. For three miles a dense mass of spectators encroached upon the road and the slightest deviation of my car would have killed many.

"The road to Chartres continued lined by reckless individuals who obliged me every moment to turn to the right or left of the road. Several times my machine bounded to the side of the pavement before I reached Chartres. The effect of this condition of affairs was shown by the smashing of my explosion boxes on the top of the cylinders of my Mors, which disabled me at once.

"There was no hope of repairing the damages within reasonable time, and even if I could have repaired them I wouldn't have attempted to go further under the existing intolerable conditions. Even if the government withdrew its prohibition

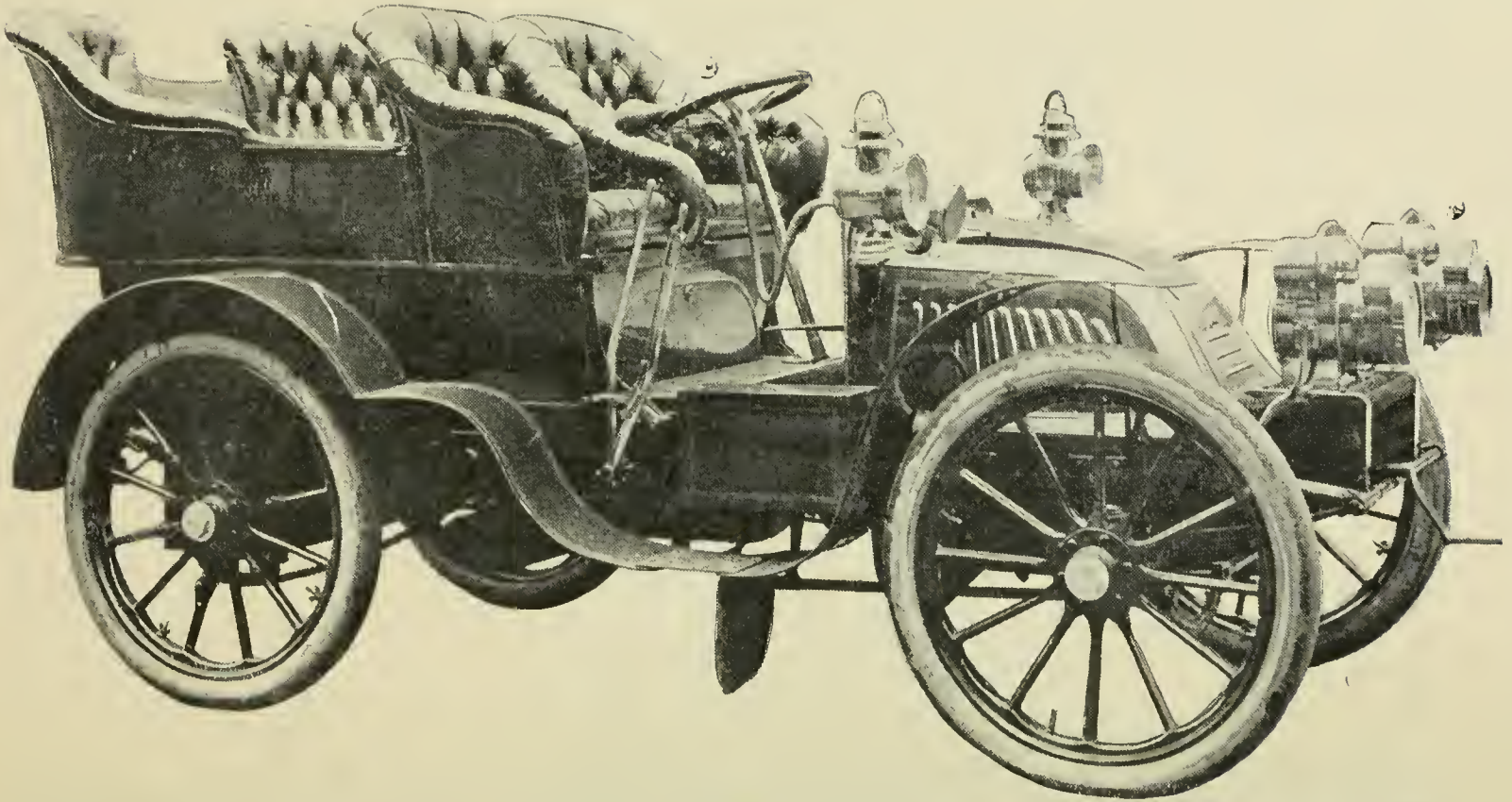
Columbia Electric and Gasolene Exhibit.

I would never again take part in a race on the highway under such circumstances.

"My machine was developing probably ninety horse power."

Naturally public attention was called to the International Coupe that was held July 2. A statement issued by the Great Britain and Ireland Automobile Club said:

"In regard to the latter 7,000 police officers, assisted by the troops and stewards, will have strict instructions to keep spectators off the roads and away from the corners. A source of danger in the Paris-Madrid race was the character of the road surface. A constant cloud of dust hid the sharp corners and prevented the drivers from seeing the gullies which occasionally cut across the road. In Ireland, however, arrangements were made to spend nearly $7,500 in removing the gullies and sharp bridges and corners were treated to prevent dust being raised. When the shock of the ill news had passed and examination of the plan or rather lack of plans for the racers had been made it was the wonder that more people had not been killed. The club committee on races for the International Challenge Cup race had taken particular pains to prevent any condition on the course which would make it hazardous for the drivers of racing cars. The French

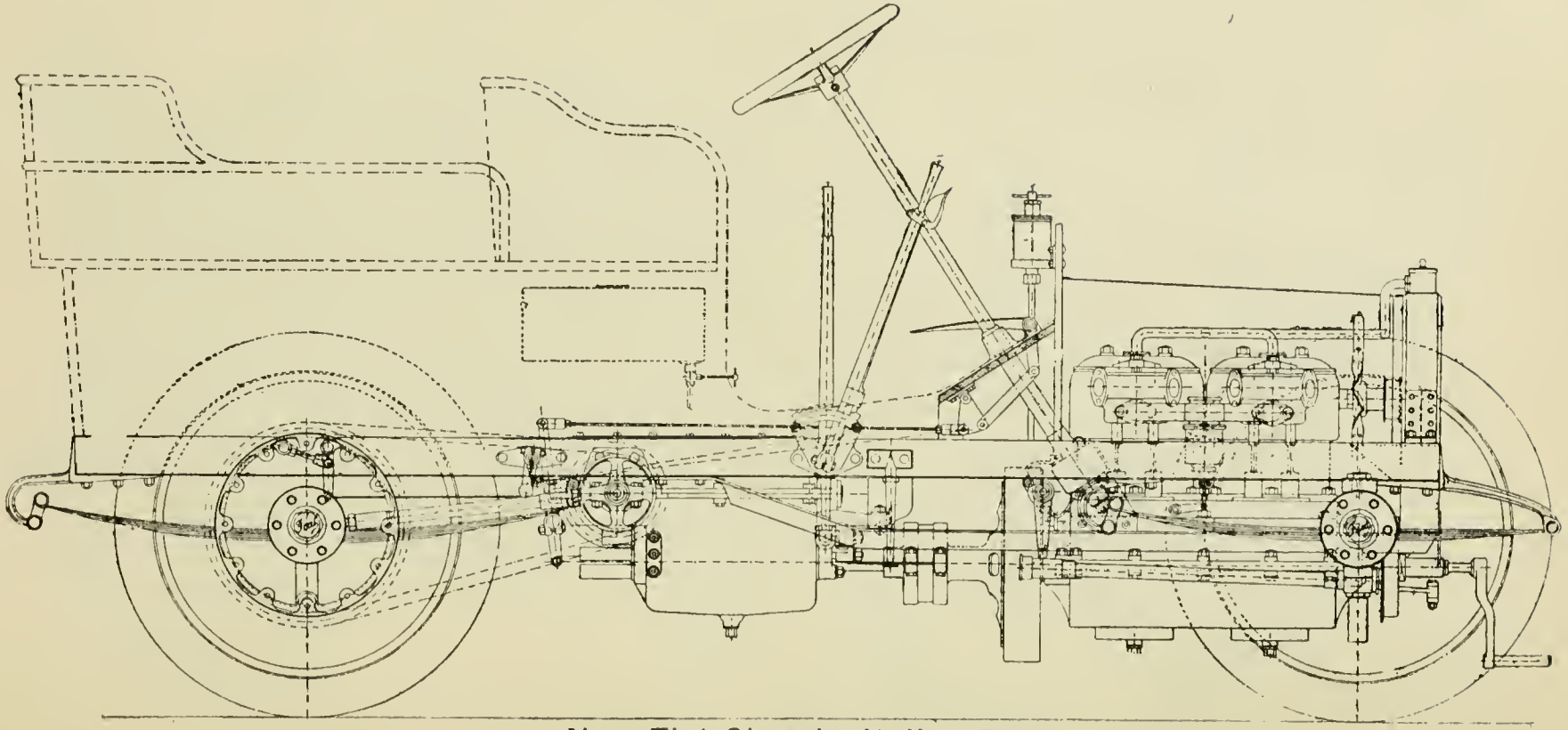


Charron, Girardot & Voigt (American Make) French Car, 15-H. P., Smith & Mabley.

club was criminally careless in the helter-skelter method of jamming hundreds of cars with more or less experienced drivers on highways choked with dust. In comparing the conditions of the Paris contest and the challenge cup race they were as different as entering a lion's cage and petting a lap dog.

"The two cases are totally different," said the Hon. John Scott Montagu, a member of the club. "Remember, that one stage of the Paris-Madrid course from Paris to Bordeaux, is 343 miles, and it is exceedingly difficult to properly safeguard such a long route. Our whole course in Ireland, on the contrary, is only 93 miles long, and along it we arranged for 7,000 police and stewards, which meant an average of more than one person on duty for every 100 yards. Instead of the 216 cars starting in the Paris-Madrid races we had only twelve, three from each of the countries enlisting —America, England, France and Germany— and the drivers of these twelve cars were all representatives of the four nations and the most skilled drivers in the world."

Racing of automobiles in the future will in all probability be confined to motordromes constructed for that purpose. One has been built in Germany and another is under way near London, England.



New Fiat Chassis, Italian Car.

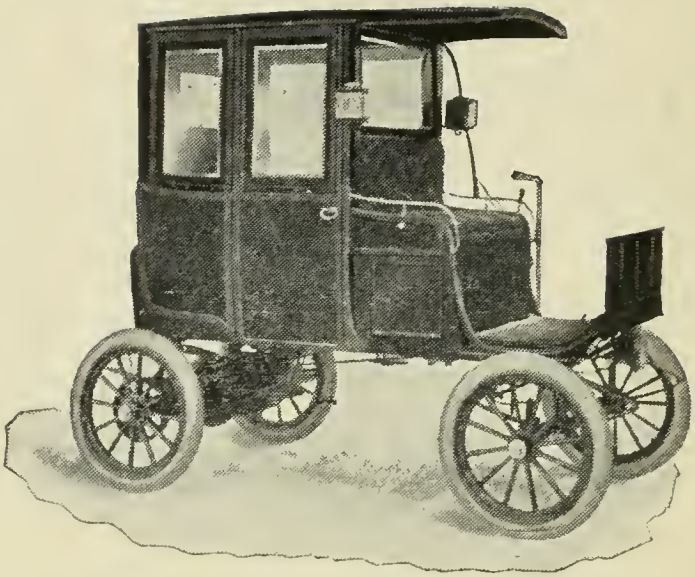
American Clubs.

The Automobile Club of America was organized June 7, 1899, at a meeting called by Mr. George F. Chamberlain. The meeting was held at the Waldorf-Astoria and the club was incorporated August 16, 1899. The club is the representative in this country for the national clubs of Great Britain and Ireland, France, Switzerland, Germany, Austria and Italy.

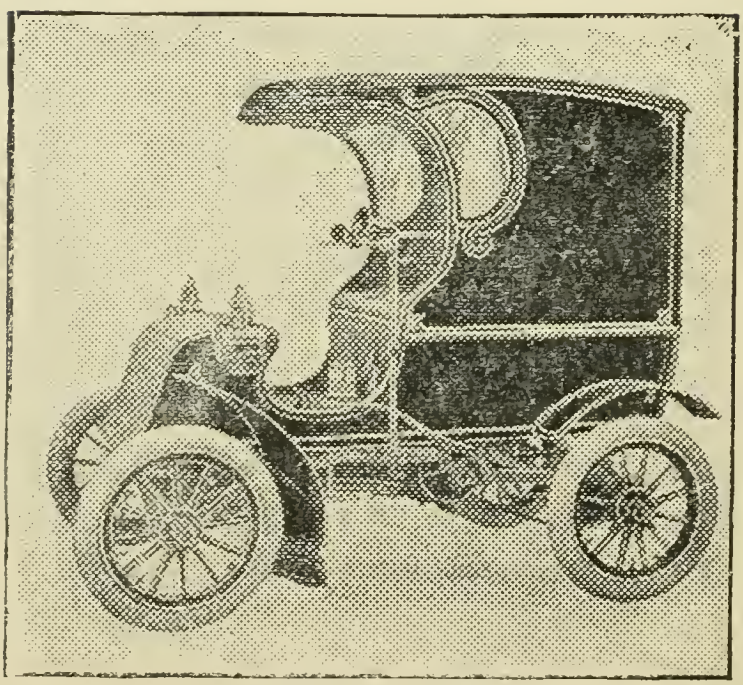
Enthusiasm ran high at the inception of the organization and a show was proposed, which was held at Madison Square Garden, November 3, 1900. A list of 33 exhibits was offered to the public of which 18 machines were loaned to the club by private owners. The day following the opening a parade was made from the Waldorf-Astoria to Riverside drive and return. The members of the club pledged themselves from the first to prevent and discourage racing upon the public highway. Runs followed to Irvington-on-Hudson, Ardsley, Babylon, L. I., Morris Park, Nyack and Philadelphia.

The first speed contest was held on the Springfield-Babylon road April 14, 1900. The distance was 50 miles and a cup was offered by M. Leonce Blanchet of the Automobile Club de France. Nine entrants competed for the cup and it was awarded to A. L. Riker; time 2 hrs. 3 min. 30 sec.

The 500-mile endurance contest from New York



Pope-Waverley Station Wagon.



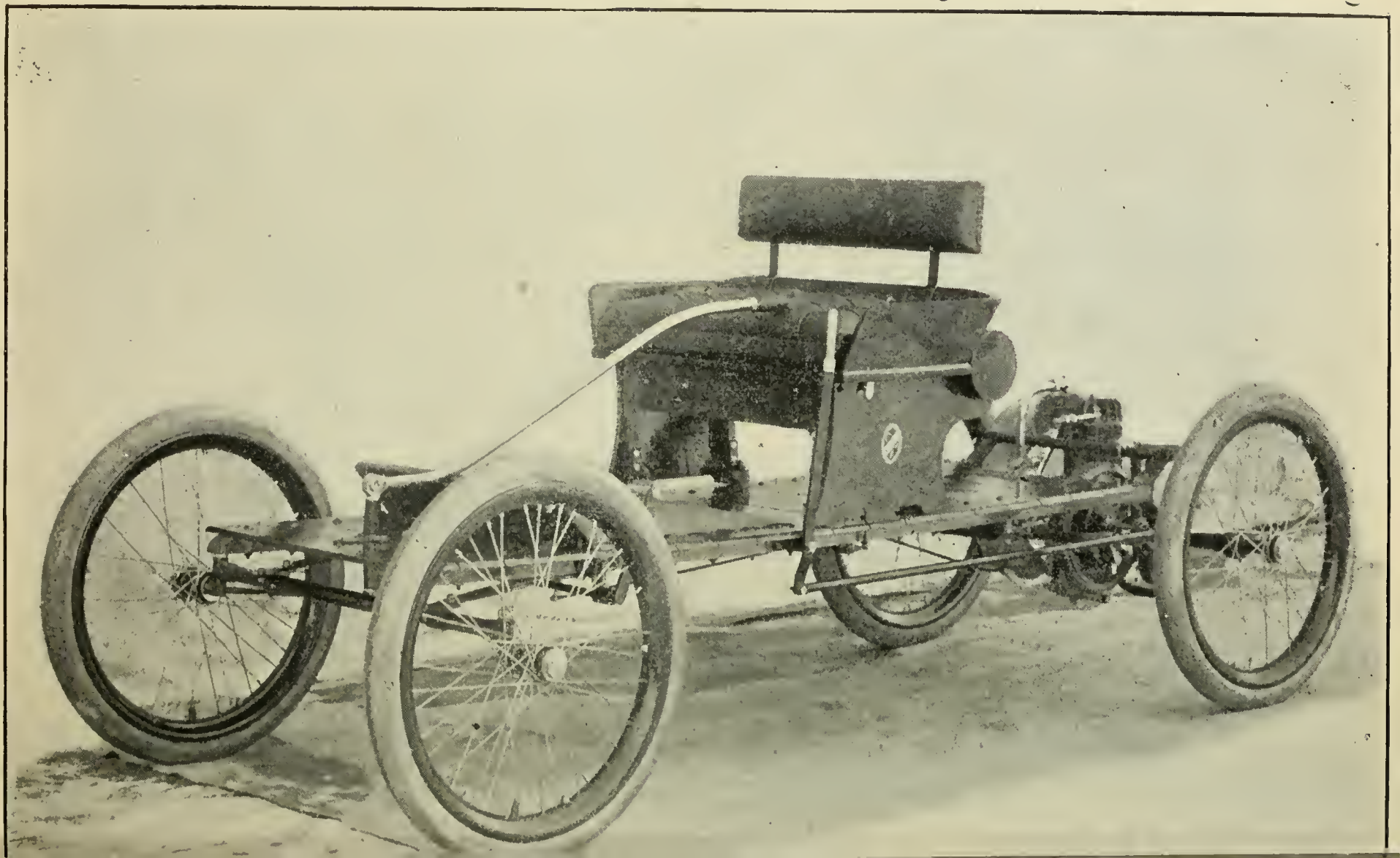
KNOX WAGON.

Capacity, 600 Pounds—Speed, 18 Miles an Hour.

to Buffalo was arranged to be held from September 9 to 14, 1901, and it promised to be an very important affair. A large number of cars were entered consisting of all classes. Of the 89 entrants only 20 averaged from 12 to 15 miles an hour, 10 from 10 to 12 miles, seven from 8 to 10 miles, and five less than 8 miles an hour. The contest ended when the machines reached Rochester. The club held an automobile show on November 2, 1901, at Madison Square Garden, and 119 exhibits were shown, of which 30 machines were loaned by the members. The following spring a brake contest was held on Riverside drive. The object was to compare the automobiles with horse drawn vehicles and ascertain whether the machines could be stopped more quickly than the horses. The rate of speed was eight miles an hour and 17 machines stopped in a distance of nine feet. A victoria drawn by horses was stopped in 17 feet 8 inches, a four-in-hand in 26 feet, and a bicycle in 8 feet.

On May 30, 1902, a non-stop run of 100 miles was arranged from New York to Southport, Connecticut, and return. Of the 75 entrants only 28 cars received certificates.

A mile and a kilometer contest was held May 31, 1902, on the South Shore Boulevard in Staten Island. Of the 39 entrants 16 drove over the course.

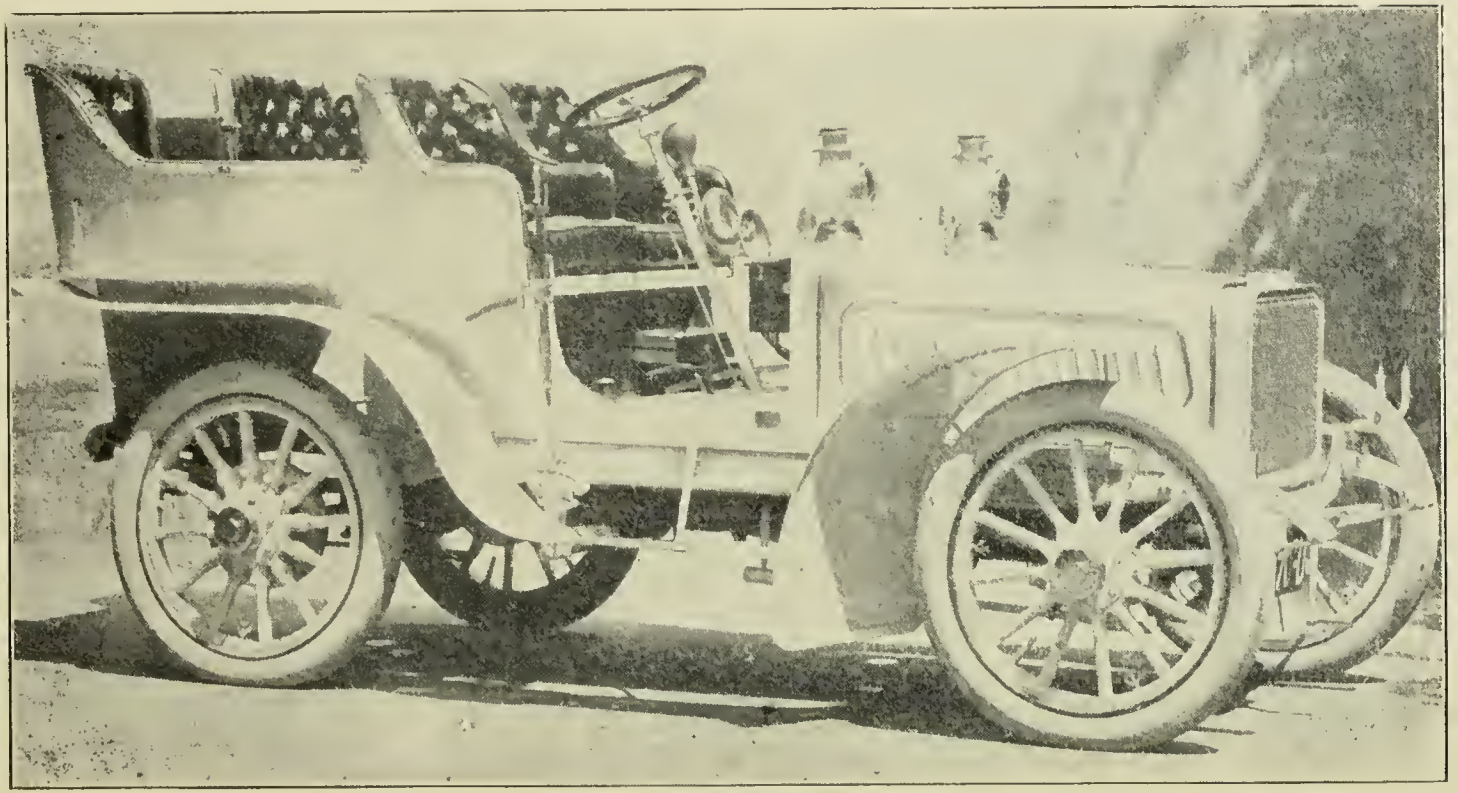


The success of the day's sport was clouded by a fatal and distressing accident.

The last big event was the 500-mile endurance run from New York to Boston and return, October 9 to 15, 1902.

The club moved later to its present headquarters on Fifth avenue. It might be said to be the wealthiest club in the city. Though one of the youngest clubs it has made a splendid record for itself. An endurance run of 500 miles from New York City to Buffalo during the Pan-American Exposition was planned in 1901, and when the vehicles reached Rochester the run was abandoned upon learning that an assassin had shot President McKinley while he was visiting the show. A club was organized at Rouen, France, and named the Automobile Club Normand in January, 1900. The club at Paris organized a race from that city to Amsterdam in 1898, a distance of 895 miles, which was won by a Panhard machine averaging 27.7 miles an hour.

The James Gordon-Bennett cup was raced for the first time from Paris to Lyons, a distance of about 354 miles in 1900 under the management of the Parisian Club. A Panhard machine won the race in 9 hours 9 minutes. The cup was challenged again in 1901 and the race was held from Paris to

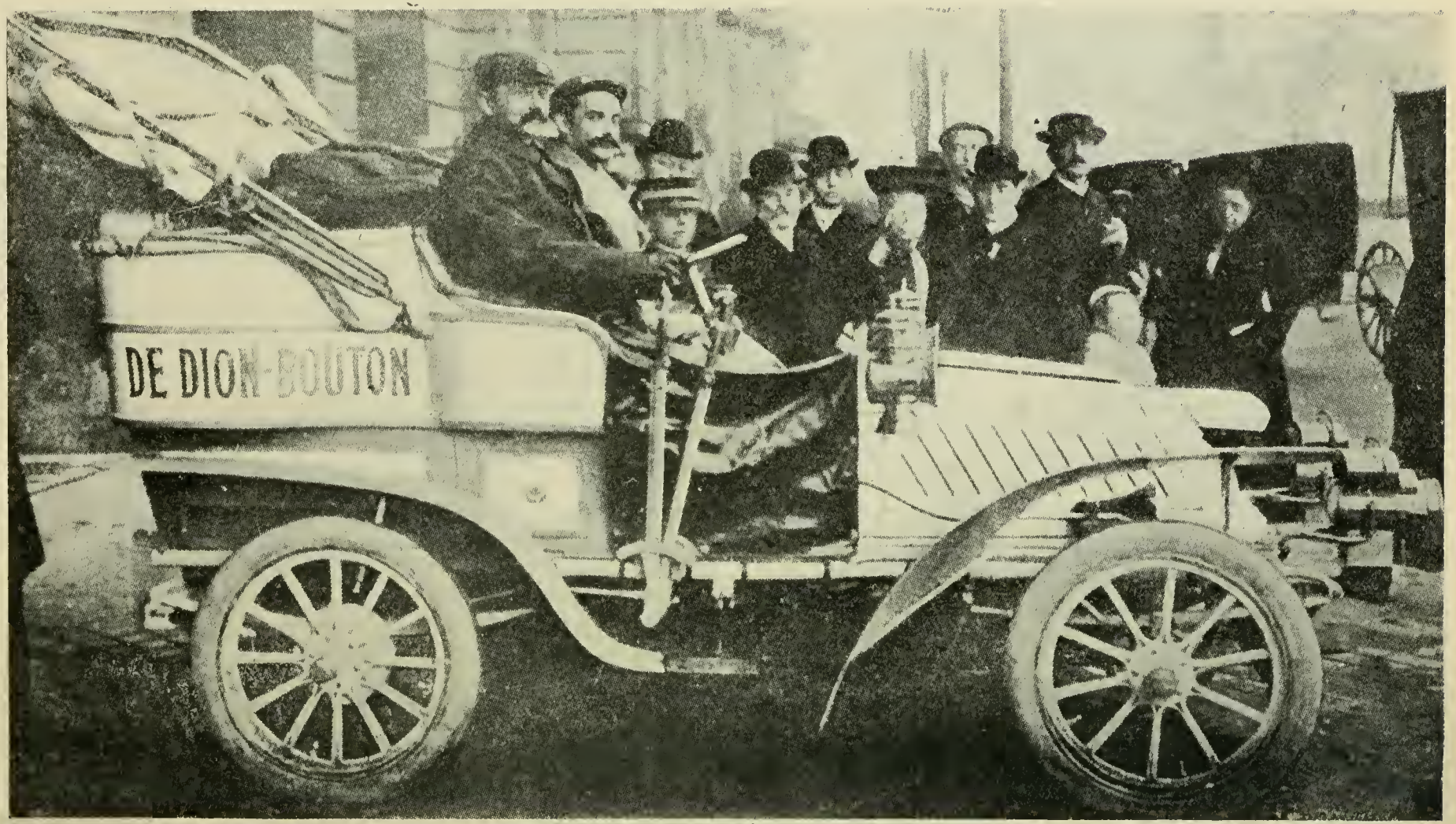


Decauville 1904 Touring Car.

Bordeaux under the management of the club. The speed and grade contests have proved of great value in demonstrating exactly what a car will do under a severe strain of full speed on a long route. It is the opinion of some experts that the terrific high speed of the powerful racers should not be employed on a route at the cross roads and bends. This was demonstrated at Nice, recently, when a car was going on the high speed at a curve and when the driver turned the steering wheel, the front wheels reared up and did not touch the ground. The rear driving wheel forced on and a collision occurred. So it was discovered that the momentum of high power cars is not always controlled by the brakes. This result and many others have been gained by racing experience. In this country the A. C. A. was followed by clubs formed in many cities. The influence of the clubs has been and is being given to secure fair legislation in the various States and urge upon the authorities the necessity of having a better condition of the highways.

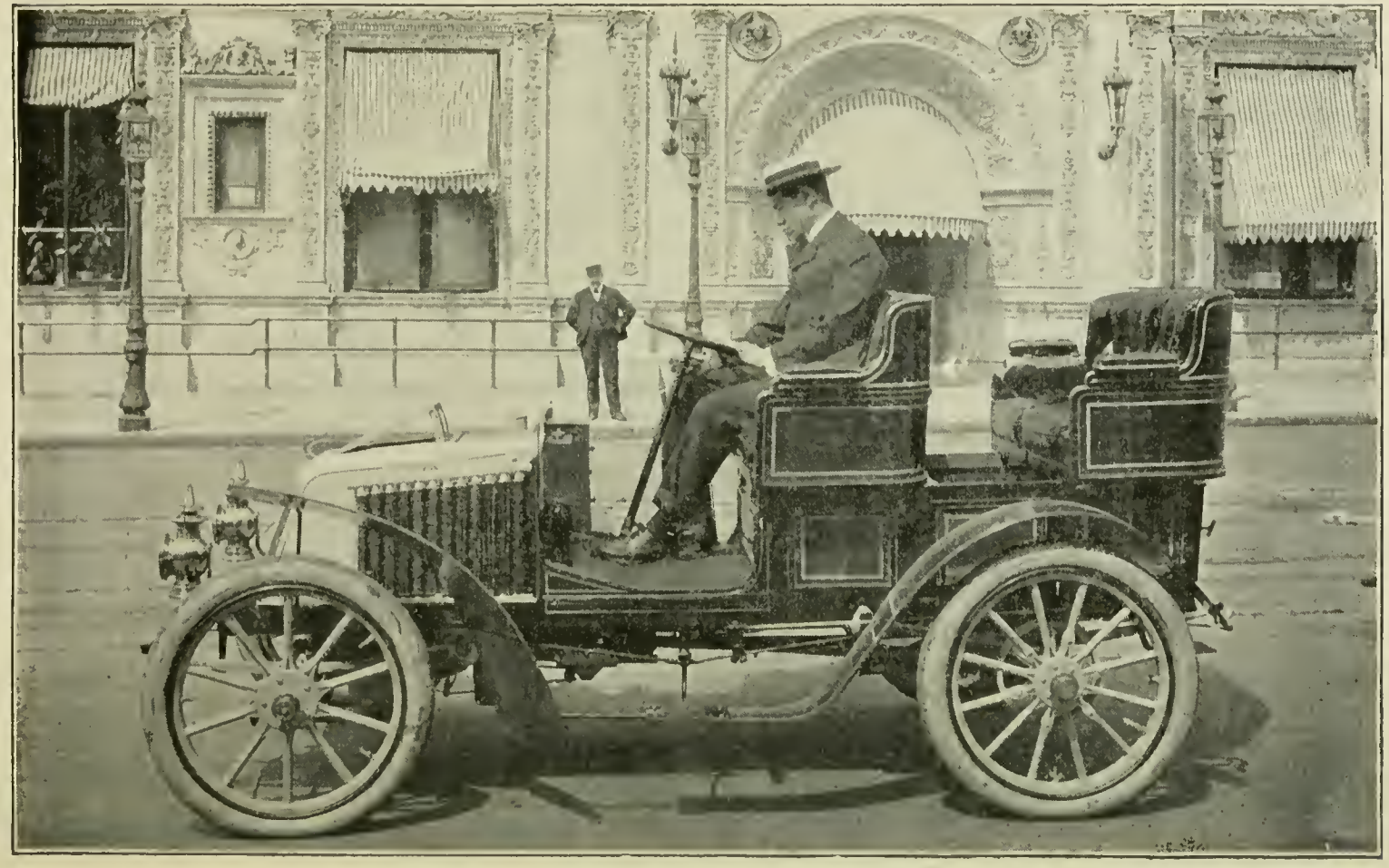
World's Records.

The world's record on tracks from one kilometer to fifty miles is very unstable; with race meets in all parts of the country, and the best drivers and machines confined to no particular track, the records will probably be lowered in every class of cars. Racing contests were held all over this country during the season of 1903: at Daytona,


DE DION-BOUTON

Ormond, Detroit, San Francisco, Boston, New York, Dayton, Indianapolis, Washington and Syracuse. In England speed tests are pulled off at the Welbeck track and when the new motordrome is completed near London, it will be doubtless the scene of many an exciting event. Vienna has her motordrome and the speed fever has entered into Russia, where a 400-mile race from the capital to Moscow is under way. Japan is interested in the motor, and the nobility of the Light of Asia are taking to motoring like ducks to water. China is a little backward, but we may expect her to follow suit (the Dowager Empress has placed an order for touring cars for her conveyance). China has a motor race track, and may have a motor race circuit, then a grand circuit, consisting of tracks in every country in the northern hemisphere will be formed, and it may be looked forward to as the only international sport. The Sons of the Orient, when disabused of the power of their idols and their minds are turned to material, mechanical channels, will make competitors worthy of the best efforts of the aryans. The Japs have demonstrated in the late war with China what they can do with a war vessel, and as they have nerve sans nerves, they will make great racers.

The qualities of a racer must be a cool head, a sound heart and quick perception. The appearance

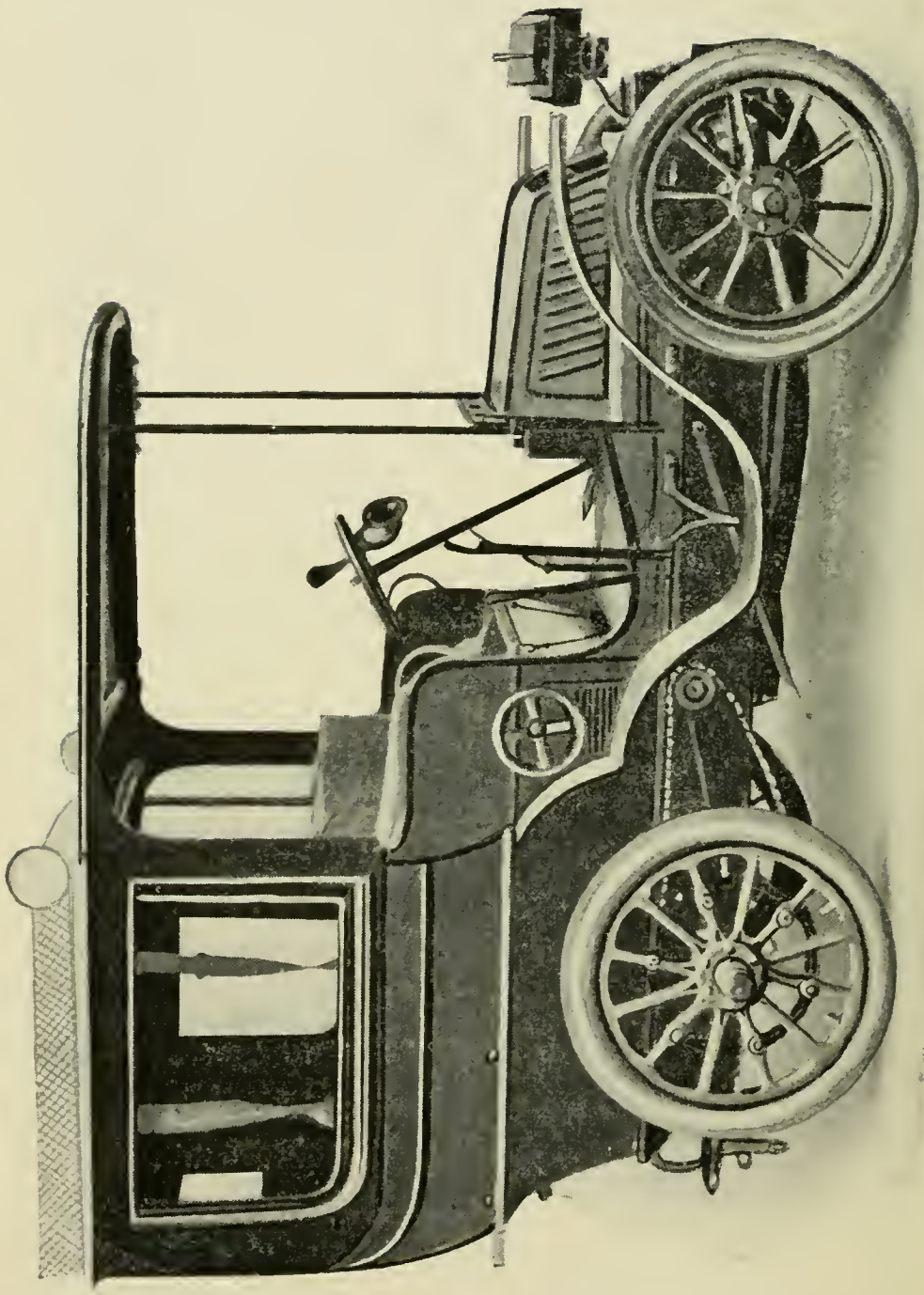


Renault Touring Automobile.

of the racers must be more presentable at the contests than in the past. The esthetic side of the sport has been much neglected. A begrimed, oil and grease bespattered contestant is not a pleasing sight, even when he has the halo of a world record. Oldfield was a striking exception in the contest at the Empire track, on May 30, 1903. He appeared in a handsome red leather coat which was favorably commented upon by the spectators. In the horse races the drivers and jockeys do not appear before the grand stand in their jumpers and overalls, and it was suggested at the Empire track that more attention to the appearance of the drivers be given at the next meet.

1903 International Challenge Cup Race.

The programme for the fortnight of automobile sports in Ireland as arranged by the Great Britain and Ireland Automobile Club has been carried out with success. The International Challenge Cup contest was an object lesson in many ways, both for people who own machines and manufacturers. The antique fossils who cried down the race were disappointed to learn that a race on the highway under proper management is practically as safe as any other sporting contest. The result of the race without a fatality either in the teams or crowds of spectators confounded the "whiners" and nullified their prophecy. The race has also proven that men



C. G. V. Enclosed Touring Car, Smith & Mabley.

properly trained and schooled by experience can drive an automobile at a high speed and remain in a normal physical and mental condition with permission to be at large. This was very patent with the French team, which was really the winner, not by the laws regulating the award of the cup, but by the fact that the three drivers covered the ground in Panhard cars with a regularity of speed that demonstrated the team could manage machines and that the French manufacturers have the knack and ability to make the best automobiles. Of the five men who finished the race, three were French: DeKnyff (Panhard), 10h. 25m.; Farman (Panhard), 10h. 26m., and Gabriel (Mors), 10h. 44m. The Germans won the cup fair and square and all honor to them. One of the Mercedes machines has proven victorious under a severe competition. Jenatzy drove the German car over the course in 10h. and 15m., winning by ten minutes.

The English and the Americans did not have a car in at the finish, but their defeat is but the stepping stone to success. Whether the causes for delay were cracked axles, as in the Mercedes driven by Foxhall Keene and Baron de Caters, or tire troubles as with a Napier driven by Edge, or trouble with gasolene as in the Winton cars driven by Winton and Owens, or defective steering gears as in the Napiers driven by Jarrott and Stock, all

Mr. and Mrs. Chas. L. Glidden and Their Napier Car on Which They Travelled to the Arctic Circle.

have profited by the race and similar defects will undoubtedly be guarded against in the next contest. The course was divided into seven circuits and the official time for the five cars completing the race is as follows:

Jenatzy, German Mercedes—(First East Circuit, 45½ miles), 48m. 58s.; (first West Circuit, 58 miles), 1h. 1m. 19s.; (second East Circuit, 45½ miles), 49m. 45s.; (second West Circuit, 58 miles), 1h. 1m. 52s.; (third East Circuit, 45½ miles), 53m. 16s.; (third West Circuit, 58 miles), 1h. 1m. 32s.; (last West Circuit, 58 miles), 1h. 2m. 18s.; (time over whole circuit, 386½ miles), 6h. 39m.; average, 49.25 miles per hour.

DeKnyff, French Panhard—(First East Circuit, 45½ miles), 49m. 17s.; (first West Circuit, 58 miles), 1h. 2m. 31s.; (second East Circuit, 45½ miles), 50m. 57s.; (second West Circuit, 58 miles), 1h. 8m. 16s.; (third East Circuit, 45½ miles), 57m. 40s.; (third West Circuit, 58 miles), 1h. 3m. 39s.; (last West Circuit, 58 miles), 1h. 3m. 50s.; total time, 6h. 50m. 40s.; average, 47.85 miles an hour.

Farman, French Panhard—(First East Circuit), 47m. 31s.; (first West Circuit), 1h. 10m. 27s.; (second East Circuit), 49m. 35s.; (second West Circuit), 1h. 5m. 55s.; (third East Circuit), 50m. 31s.; (third West Circuit), 1h. 2m. 17s.; (last West Circuit), 1h. 5m. 28s.; total time, 6h. 51m. 44s.; average, 47.72

Winthrop E. Scarritt, President of the Am. Auto Club 1904.

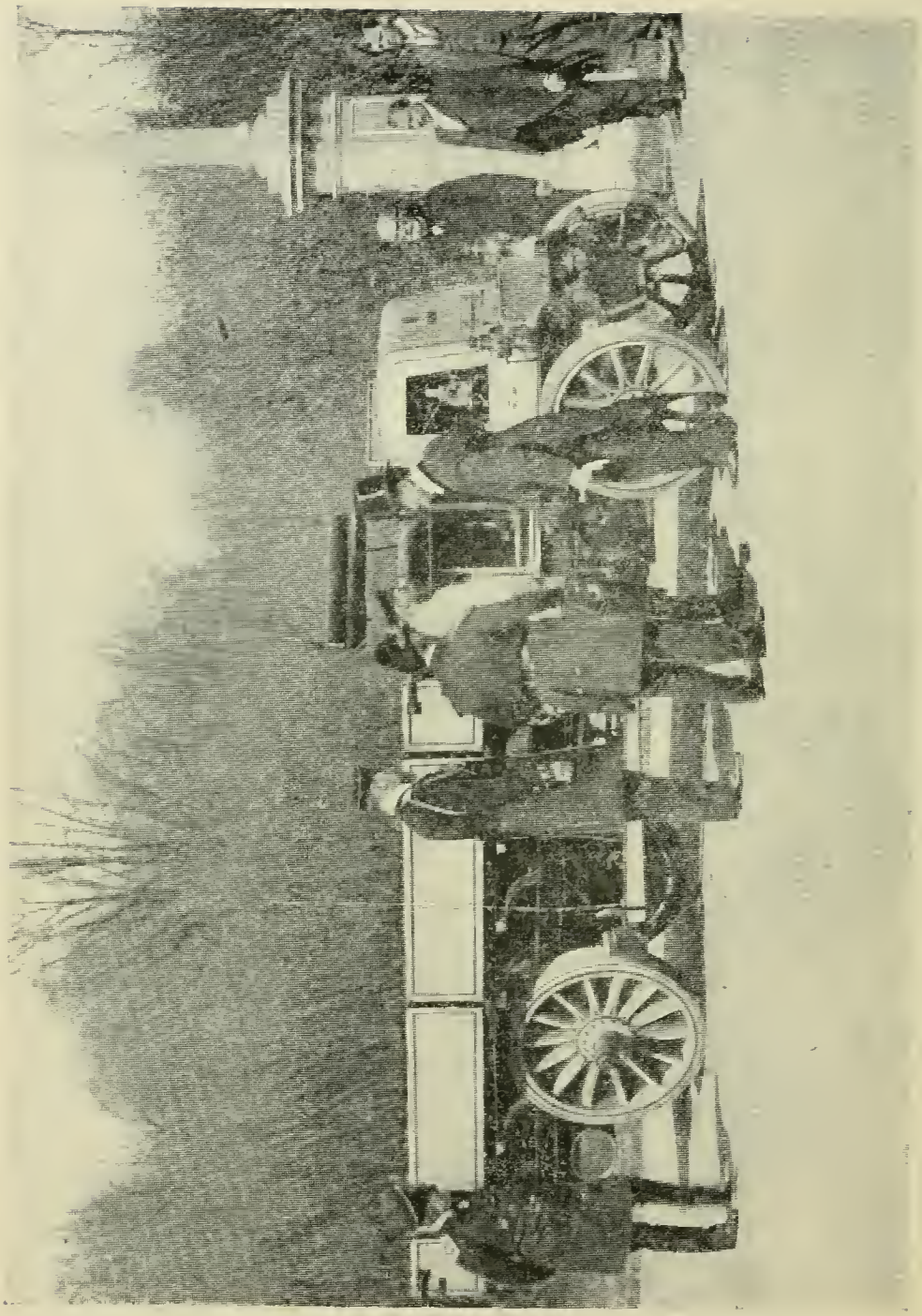
miles an hour.

Gabriel, French Mors—(First East Circuit), 53m. 10s.; (first West Circuit), 1h. 19s.; (second West Circuit), 1h. 2m. 37s.; (second West Circuit), 1h. 4m. 20s.; (third East Circuit), 57m. 4s.; (third West Circuit), 1h. 13m. 58s.; (last West Circuit), 1h. 6m. 5s.; total time, 7h. 11m. 33s.; average time, 45.33 miles an hour.

Edge, English Napier—(First East Circuit, 46m. 23s.; (first West Circuit), 1h. 7m. 3s.; (second East Circuit), 1h. 27m. 59s.; (second West Circuit), 1h. 24m. 59s.; (third East Circuit), 1h. 14m. 35s.; (third West Circuit), 1h. 52m. 21s.; (last West Circuit), 1h. 22m. 28s.; total time, 9h. 15m. 48s.; average time, 35.16 miles an hour.

The whole event from start to finish was a magnificent exhibition of the great courage, skill and iron nerve of the drivers and the high degree of proficiency to which the manufacturers of automobiles have reached.

The race for the International Challenge Cup was followed by a contest of a flying kilometre in Phoenix Park, Dublin. The racing track extends along a fine stretch of road between the Gough statue and Castlenock Gate, a distance of 2,853 yards. Baron de Forest drove his 70-horse power Mors one kilo in 26¾ seconds, which is equal to 84.4 miles an hour. In the tourist car race of machines



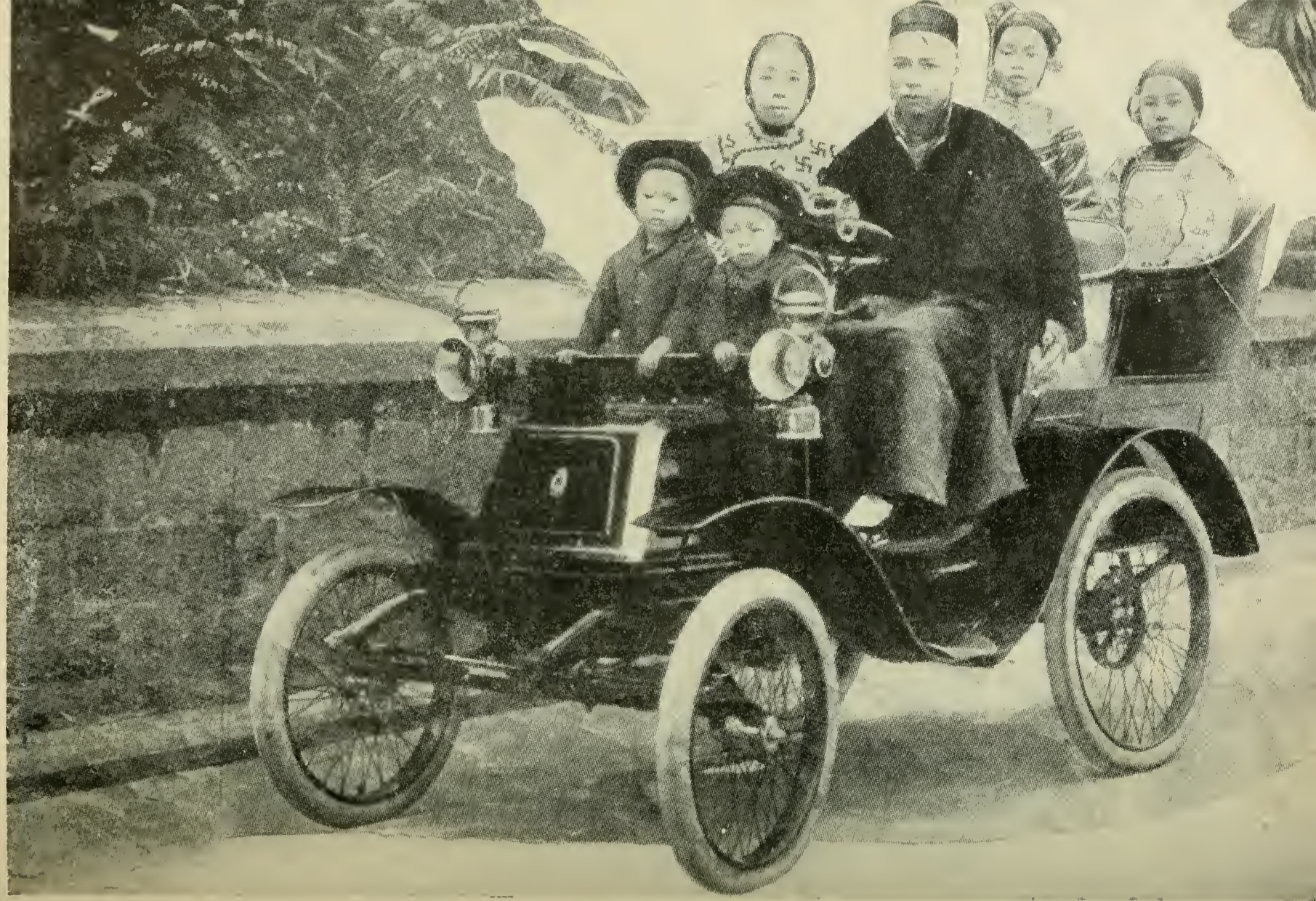
Czar of Russia Inspecting a Daimler Army Wagon.

costing less than $1,500, a 10-horse power Duryea won in 2m. 27 45s. In Class "D," cars valued between $1,500 and $3,250, a 24-horse power Georges-Richards won in 2m. 16 4-5s. In Class "E," cars valued between $3,250 and $5,000, a 20-horse power Humber won in 2m. 6 1-5s. In Class "F," cars valued at $5,000 or more, a 30-horse power Wolseley won in 2m. 13 3-5s. The steam power class was represented by only one 6-horse Gardner-Serpollet, which received a second medal. Three cars were entered in the open event for one flying kilo. The result was as follows: 70-horse power Mors, 27 1-5s.; 80-horse power Mors, 28s., and 100-horse power Gobron-Brille, 28 2-5s.

In the hill climbing contest, the cars climbed a hill 600 yards, grade 1 to 7, from a standing start. A straightaway start of 100 yards before the ascent afforded the drivers an opportunity to get the machines under good control. Five cars were entered. A 60-horse power Mercedes won in 32 2-5s., 80-horse power Mors second in 33 4-5s., and the other three made the grade as follows: 60-horse power Mercedes, 36s.; 70-horse power Napier, 37 2-5s., and a 60-horse power Mercedes, 38 1-5s.

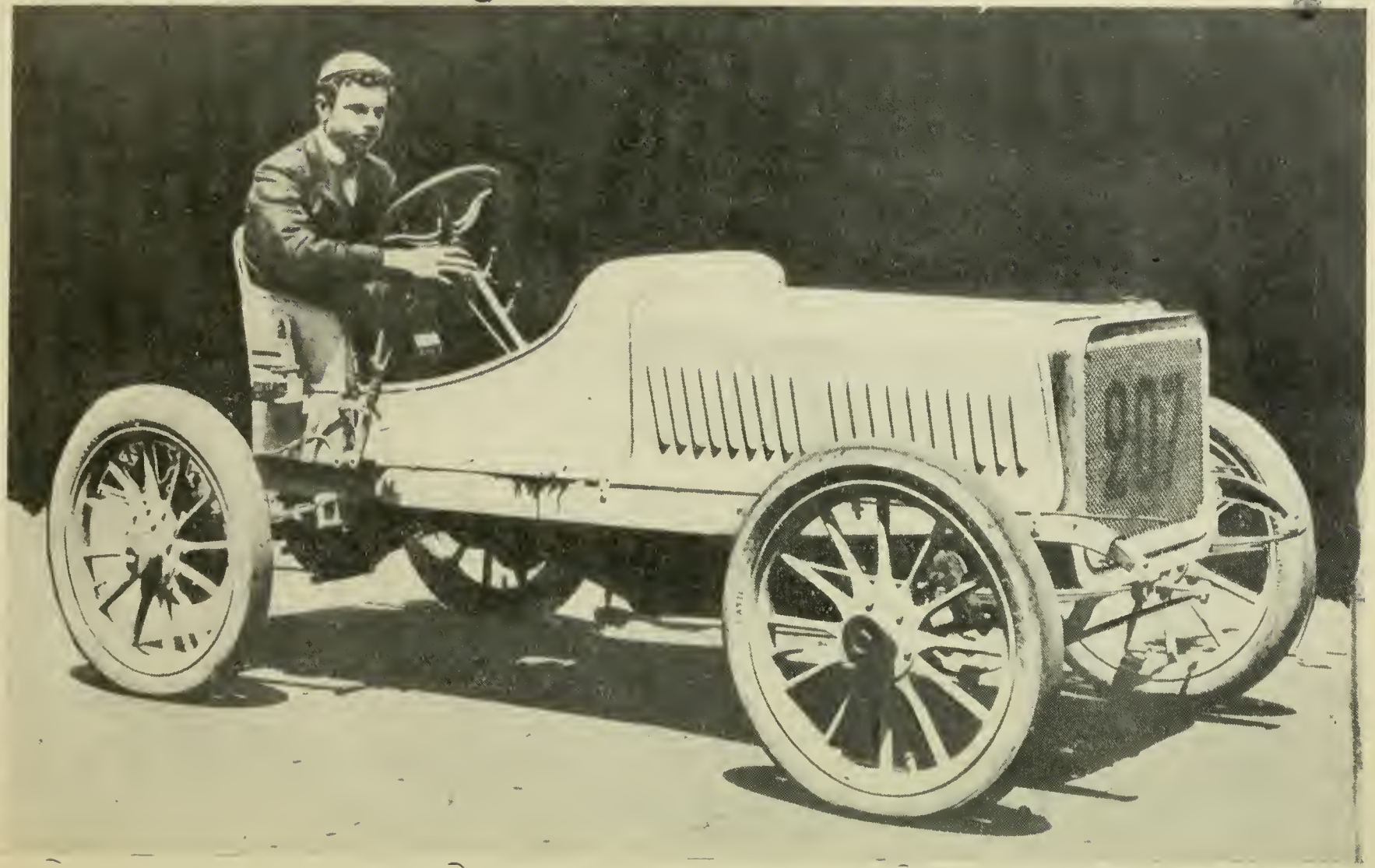
Speed Indicator.

No automobile is complete for city or country use without a speed indicator. There is a need for the timepiece especially in this state under the



Georges-Richards Touring Car Owned by Hon. Chan Lye Mine of Hong-Kong, China.

present automobile laws. A popular French indicator consists of a shaft with a transmission pulley connected to the wheel by a flexible shaft connection, and the indicator is arranged with internal gear, according to the sized wheel the instrument is to be used for. It has two excentrics for the automatic winding up of the apparatus while the car is moving. The shaft is fitted with a worm gear which operates the clockwork and records on the coil of paper the rate of speed at which the car is travelling per hour, while the indicating hand shows on the dial the exact speed at which it is travelling. The dial is graduated from 0 to 60 kilometres per hour, and the hand indicates the speed every three seconds by means of a pin which perforates the strip of paper. The kilometre apparatus also punctures on a red line with a pin which perforates the strip of paper. The kilometre apparatus punctures on a roll of paper every 250 metres, so that four punctures equal one kilometre. The paper roll, which is 25 metres long, is sufficient for 80 hours, and is transported by two rollers independent of the clockwork, which at the same time indicates the minutes. This instrument records the speed by a line drawn on the paper, rising and falling according to the rate of speed the car is travelling.

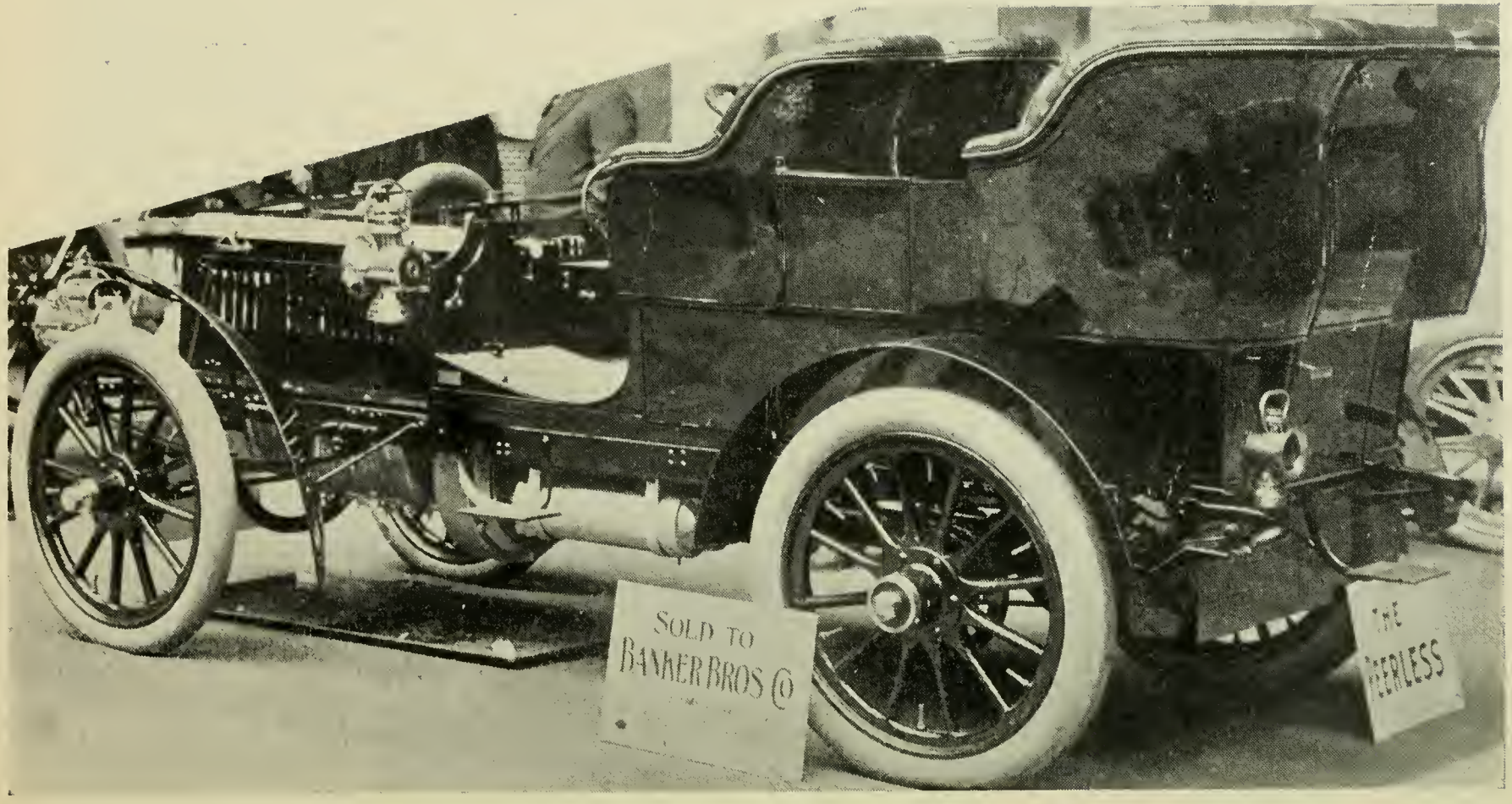


40-H. P. Decauville, Driven by Henri Page.

The indicator is a silent witness of the speed of a car and it will serve as a protection when drivers are arrested unjustly for exceeding the speed limit.

American Made Cooler.

Americans are making inroads on the automobile field and the Europeans are watching the progress with worried countenances. The latest move is to make coolers for machines in this country, and by so doing it brings the cost of them down to about one-third of the value of imported coolers. The rough, crude appearance of the coil cooler has been submitted to, not from choice, but from necessity. When the honeycomb design was introduced many of the car builders saw at a glance that it was the cooler which would be popular. The design of the new cooler had many advantages. The cooler takes less room and presents a more handsome appearance than the coils, and it can be used with a water tank of 3 to 5 gallons capacity, while the coils are constructed with water tanks of 15 to 20 gallons capacity. Mr. W. J. Kells, of Jersey City, is the first American to manufacture honeycomb coolers in this country. He is a practical mechanic and has had considerable experience in metal work before he began the manufacturing of automobile tanks, coils and mud guards. Mr. Kells designed and made a honeycomb cooler in 1891,



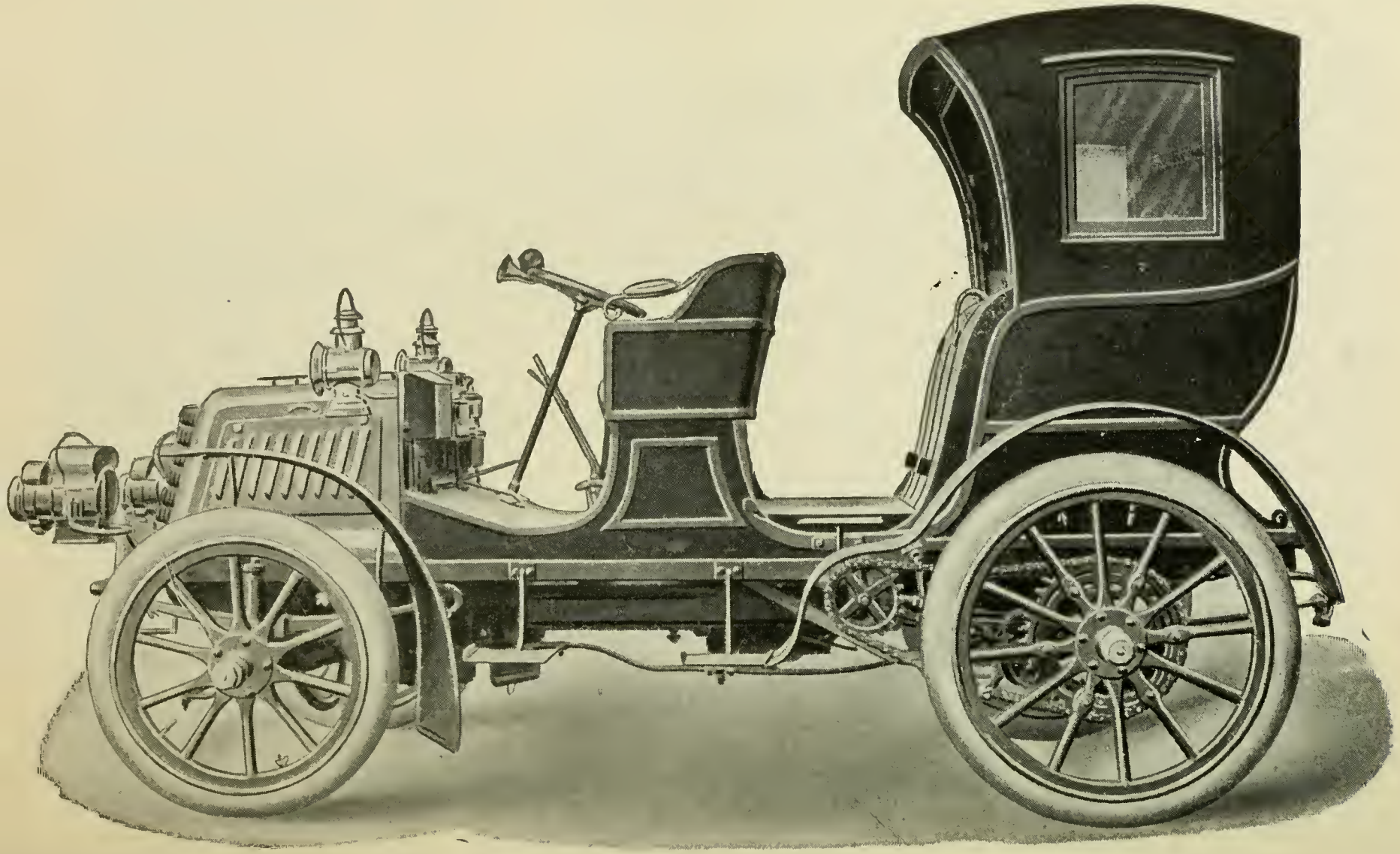
Peerless, 1903, Banker Bros., Madison Square Garden Show.

which though crude, was found to be very practical. He began work on tanks and coolers in 1900, and in January, 1903, built the first modern honeycomb cooler for the Moyea car. The coolers are made from sheet brass and copper tubes. They can be placed on any car built in this country. The coolers are constructed with from 1,500 to 3,000 tubes and he has built a few special coolers with 3,100 tubes. The Kells coolers have been put on some of the imported and American cars. Mr. Kells' plant has had a steady growth and the output at present is from 20 to 30 coolers a month.

A number of records were lowered at the Empire track, Yonkers, N. Y., and the Readville track, at Boston; at Denver and San Francisco. The world's records of maximum miles an hour are as follows:

Gasolene machines over 2,000 pounds:

1 kil.,	M. Angiers, Mors, Paris,	0.29,	Nov. 17,	1902
1 m.,	M. Angiers, Mors, Paris,	0.46,	Nov. 17,	1902
1 m.,	B. Oldfield, 70-H. P. Cooper, Empire City track, 1.01 3-5, May 30, 1903.			
2 m.,	Alex. Winton, Cleveland,	2.12,	Sept. 17,	1902
3 m.,	Alex. Winton, Cleveland,	3.17,	Sept. 17,	1902
4 m.,	Alex. Winton, Cleveland,	4.22 2-5,	Sept. 17,	1902
5 m.,	Alex. Winton, Cleveland,	5.28,	Sept. 17,	1902
6 m.,	Alex. Winton, Cleveland,	6.34 3-5,	Sept. 17,	1902
7 m.,	Alex. Winton, Cleveland,	7.38,	Sept. 17,	1902
8 m.,	Alex. Winton, Cleveland,	8.42,	Sept. 17,	1902
9 m.,	Alex. Winton, Cleveland,	9.45½,	Sept. 17,	1902
10 m.,	Alex. Winton, Ormond Beach,	10.26,	March 28,	1903
11 m.,	A. C. Bostwick, Yonkers,	14.02 2-5,	Oct. 8,	1901



Packard, 1904. Touring Car

12 m..	A. C. Bostwick, Yonkers,	15.21,	Oct.	8. 1901
13 m..	A. C. Bostwick, Yonkers,	16.38 4-5,	Oct.	8. 1901
14 m.,	Hy. Fournier. Mors. Fort Erie.	17.53 3-5,	Sept.	26, 1901.
15 m.,	Hy. Fournier, Fort Erie.	19.10 4-5,	Sept.	26, 1901
16 m.,	Hy. Fournier, Fort Erie,	20.24 4-5,	Sept.	26, 1901
17 m.,	Hy. Fournier, Fort Erie,	21.40 4-5.	Sept.	26, 1901
18 m..	Hy. Fournier. Fort Erie,	22.56 4-5,	Sept.	26. 1901
19 m.,	Hy. Fournier, Fort Erie,	24.12 2-5.	Sept.	26, 1901
20 m.,	Hy. Fournier, Fort Erie,	25.25 2-5.	Sept.	26, 1901
25 m.,	Hy. Fournier, Fort Erie,	31.44 1-5,	Sept.	26, 1901
50 m..	Alex. Winton. Chicago.	1.17.50.	Sept.	18. 1900
105 m..	J. E. Ewing, Long Island,	2.24,	Apr.	26, 1902

Gasolene machines weighing from 1,000 to 2,000 pounds:

1 kil.,	Jenatzy.	0.35 2-5,		
1 m.,	Barras, Darracq	1.10 4-5.		
1 m..	H. S. Harkness, Detroit.		Oct.	24, 1902
2 m.,	H. S. Harkness, Detroit.		Oct.	24, 1902.
3 m..	H. S. Harkness, Detroit.		Oct.	24, 1902
4 m..	H. S. Harkness, Detroit,		Oct.	24, 1902
5 m..	H. S. Harkness, Detroit.	6.01 2-5.	Oct.	24. 1902
10 m.,	E. Apperson, Detroit,	17.47½,	Oct.	10, 1901
15 m.,	C. M. Hamilton, Fort Erie.	29.44.	Sept.	26, 1901

Records of races of machines under 1,000 pounds:

1 kil.,	Barras.	Nice,	0.35 1-5,		
1 m.,	H. T. Thomas.	Ormond Beach.	1.06,	Mar.	28, 1903
1 m..	W. Wigle.	Detroit,		Oct.	24, 1902
2 m..	W. Wigle,	Detroit,		Oct.	24, 1902
3 m.,	W. Wigle.	Detroit.		Oct.	24, 1902
4 m..	W. Wigle,(O'ds)	Detroit,	7.50,	Oct.	24, 1902

In the steam class Serpollet leads for 1 kil. distance, but Stanley and Cannon, of Boston, have made better time on a mile. The records are as follows:

1 kil.,	Serpollet,	Nice,	.27,	Apr.	8, 1903
1 m.,	F. E. Stanley.	Readville,	1.02 4-5.	May	30, 1903
1 m.	G. C. Cannon,	Readville,	1.04 2-5,	May	30, 1903
2 m.,	G. C. Cannon,	Providence,	2.25 3-5,	Sept.	24, 1902
3 m.,	G. C. Cannon,	Providence,	3.40 2-5,	Sept.	24, 1902
4 m.	G. C. Cannon,	Providence,	4.53 2-5,	Sept.	24, 1902
5 m.,	G. C. Cannon,	Providence,	6.05,	Sept.	24, 1902
10 m.,	R. White, White,	Detroit.	19.05 2-5.	Oct.	24, 1902

Stevens-Duryea, 1904, Model.

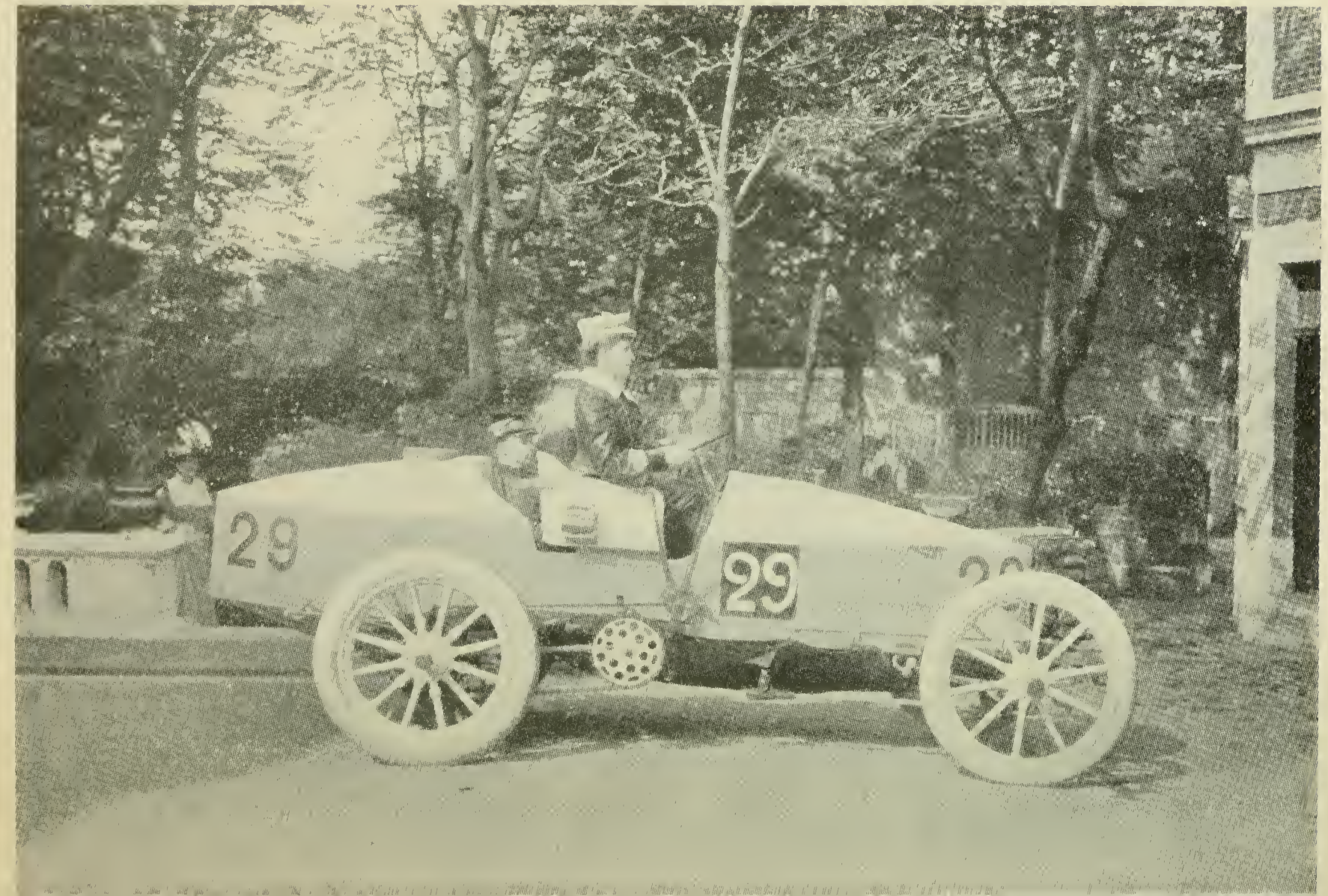
25 m., S. T. Davis, Jr., Locomobile, Long Island, 58.13, April 14, 1900.
50 m., S. T. Davis, Jr , Long Island, 2.18.27, Apr. 14, 1900

In the electric class the records stand as follows:

1 kil., W. C Baker, Baker, Staten Island, 0.36 1-5, May 31, 1902.

1 m.,	W. C. Baker,	Detroit,	1.42,	Oct	24, 1902
2 m.,	W. C. Baker,	Cleveland.	3.37 2-5,	Oct.	25, 1902
3 m.,	W. C. Baker,	Cleveland,	5.26,	Oct.	25, 1902
4 m.,	W. C. Baker,	Detroit,	7.15,	Oct.	25, 1902
5 m.,	W. C. Baker,	Detroit,	8.51 4-5,	Oct.	25, 1902
6 m.,	W. C. Baker,	Detroit,	10.56,	Oct.	25, 1902
7 m.,	W. C. Baker,	Detroit,	12.44 2-5,	Oct.	25, 1902
8 m.,	W. C. Baker,	Detroit,	14.30,	Oct.	25, 1902
9 m.,	W. C. Baker,	Detroit,	16.14,	Oct.	25, 1902
10 m.,	W. C. Baker,	Detroit,	17.58,	Oct.	25, 1902

25 m., A. L. Riker, Riker, Long Island, 1.00.36, April 14, 1900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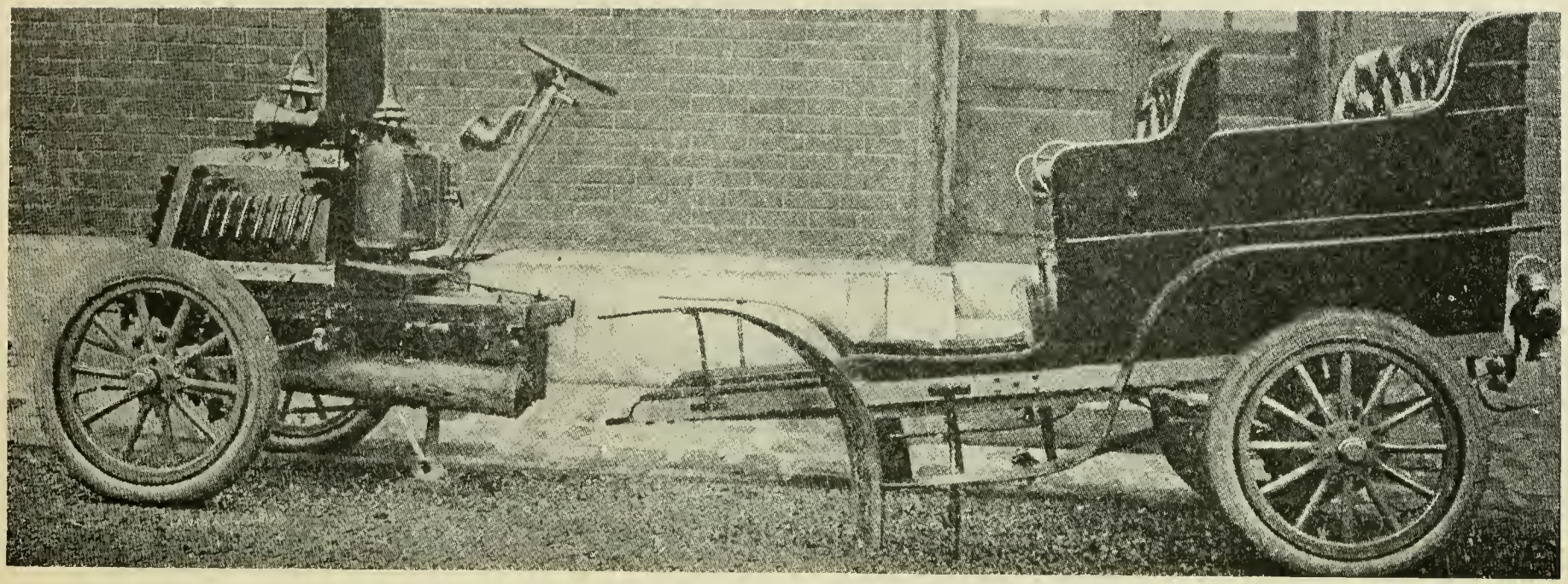
Itinerary.	Express Train Time	Auto Records	
Paris-Boulogne (260 kil)	3 h. 20 m.	4 h. 17 m..	Girardot, 1899
Paris-Rouen (140 kil.)	1 h. 42 m.	2 h. 15 m.,	Giraud, 1900
Paris-Trouville (172 kil.)	6 h. 10 m.	2 h. 58 m.,	Antony, 1899
Paris-Saint-Malo (440 kil.)	8 h. 52 m.	7 h. 11 m.,	Renaux, 1899
Paris-Brest (610 kil.)	11 h. 43 m.	11 h. 30 m.,	Corre, 1899
Paris-Bordeaux (580 kil.)	7 h. 2 m.	6 h. 11 m.,	Fournier, 1901
Bordeaux-Biarritz (200 kil.)	3 h.	2 h. 56 m.,	Levegh, 1899
Bayonne-Pau (120 kil.)	2 h. 56 m.	1 h. 20 m.,	M. Farman, 1901
Paris-Toulouse (760 kil.)	12 h. 09 m.	10 h. 2 m.,	Levegh, 1900
Nice-Marseille (205 kil.)	4 h. 15 m.	3 h. 22 m.,	Beconnais, 1900
Paris-Lyon (par Nevers, 510 kil.)	14 h.	10 h. 36 m.,	Charron, 1900
Paris Nancy	4 h. 40 m.	5 h. 19 m.,	R. de Knyff, 1899
Nancy-Aix	11 h. 53 m.	6 h. 49 m.,	Charron, 1899
Aix-Vichy	8 h. 39 m.	8 h. 12 m.,	Charron, 1899
Vichy-Perigueux	8 h. 36 m.	6 h. 44 m.,	R. de Knyff, 1899
Perigueux-Nantes	11 h. 49 m.	6 h. 52 m.,	Chasseloup-Laubat, 1899
Nantes-Cabourg	13 h. 21 m	6 h. 26 m.,	Levegh, 1899
Paris-Roubaix (240 kil.)	3 h. 48 m.	3 h. 48 m ,	Barras, 1900
Paris-Ostende (330 kil.)	7 h. 2 m.	8 h. 8 m.,	Barras, 1899
Paris-Liege-Amsterdam (660 kil.)	10 h. 14 m.	14 h. 12 m.,	Charron, 1898
Paris-Berlin (1,200 kil.)	20 h. 5 m.	16 h. 6 m.,	Fournier, 1901
Paris-Marseille	5h. 13 m,	31 1-5s.,	Gabriel, 1903



Detachable Motor, Designed by M. Lacoin, Paris, 1904.

The record of road racing started with:
Levassor, Panhard, 24 miles an hour, 1895.
Mayade, Panhard, 25 miles an hour, 1896.
Hourgieres, Panhard, 38 miles an hour, 1897, followed by Jamin, L. Bollee, 48 miles an hour.
Charron, Panhard, 46 miles an hour, 1898.
Levegh, Mors, 68 miles an hour, 1899.
R. de Knyff, Panhard, 72 miles an hour, 1900.
Fournier, Mors, 85 miles an hour, 1901.
R. de Knyff and Jarrott, Panhard, 90 miles an hour, 1902, followed later by De Crawbez, Panhard, 97 miles an hour.
Louis Renault, Renault, 74½ miles (est.) an hour,

Renard Train Sans Tracks. Introduced at Paris in 1904.

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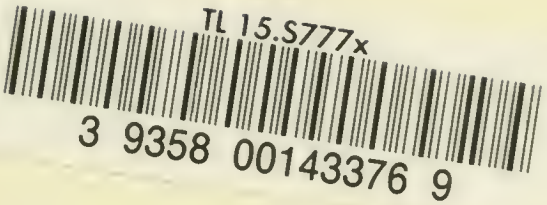

Sports of the Times

Story of the automobile from the first toy car to the present self propelled vehicle. New York, Sports of the Times, 1905.